

APPENDIX

SHRIMP U–PB ZIRCON AGES FROM CENTRAL QUEENSLAND

C.M. FANNING, I.W. WITHNALL, L.J. HUTTON, R.J. BULTITUDE,
F.E. VON GNIELINSKI & I.P. RIENKS

INTRODUCTION

Samples submitted for dating were splits of coarsely crushed material that had been prepared for geochemical analysis. The samples were submitted in separate batches of up to ten samples over the period from 1997 to 2001. Zircons were separated at the Research School of Earth Sciences, The Australian National University using standard techniques (Wilfley table, magnetic separation, heavy liquids and hand picking). Cathodoluminescence (CL) images were taken prior to analysis in most of the later batches and some of these are presented in Figure 42. Analysis was undertaken on the sensitive high-resolution ion microprobe (SHRIMP II) at the Research School of Earth Sciences following techniques given by Williams (1998 and references therein). Analyses consist of six scans through the mass range with a spot size of *ca* 30µm. U/Pb ratios in most samples were determined by reference to the AS3 zircon standard, but ten samples were determined by reference to the FC1 standard (both from the 1099Ma Duluth Gabbro zircons, Paces & Miller 1993). Data were reduced using the SQUID Excel Macro of Ludwig (2000). Uncertainties are given at the one sigma level with weighted average age uncertainties at the 95% confidence level with plots and calculations from ISOPLOT/EX (Ludwig 1999). Common Pb was corrected using measured $^{207}\text{Pb}/^{206}\text{Pb}$ and $^{238}\text{U}/^{206}\text{Pb}$ ratios (Tera & Wasserburg 1972; Compston & others, 1992).

Processing of data for the samples in this Appendix using the SQUID Excel Macro resulted in some dates becoming younger than originally determined. For example a preliminary age of ~303Ma referred to by Withnall & others (1997, 1998a,b) and Hutton & others (1999a,b) for RSC074A (Lotus Creek Rhyolite) was later determined to be 295 ± 3.4 Ma when reprocessed using the SQUID program.

The analytical data are presented, along with selected plots (generally Tera-Wasserburg and probability density plots and plots of weighted means) for full datasets and/or subsets where appropriate. The following section contains brief notes on each of the samples and their results. They are discussed with reference to their host geological province and then by geological unit.

AUBURN ARCH – VOLCANIC ROCKS

TORSDALE VOLCANICS

IRAU613: rhyolitic ignimbrite

Mount Misery, BUNGABAN MGA 231700 7135650
(Table 1, Figure 1)

Eighteen grains were analysed with most plotting as a concordant group with the exception of one younger, clearly discordant grain (9.1). The data produces a weighted mean of 313.8 ± 3.1 Ma with an MSWD of 2.5 indicating excess scatter. Rejecting the discordant analysis and three other older and younger outliers (4.1, 8.1 and 15.1) produces an age of 314.9 ± 2.9 Ma (external error, MSWD = 1.08), which is taken as the best estimate of the crystallisation age.

Whitaker & others (1974) reported a single K-Ar hornblende age of 343Ma (early Carboniferous) for the rhyolitic ignimbrite from this locality. The early Carboniferous age obtained has been much quoted in the literature, and the Mount Misery outcrop shows evidence of having been subsequently sampled for palaeomagnetism. Any conclusions resulting from such work might need to be modified. The older age obtained by the K-Ar dating may be due to excess argon in the hornblende.

IWGN145: crystal-rich rhyolite ignimbrite

Moura Railway, near Banana Range, BANANA MGA 224328 7295987
(Table 2, Figure 2)

The zircons from this sample are unusual. The grains are relatively small, mostly less than 100 microns in length, and are irregular in outline. They are clear apart from inclusions of apatite and clay minerals in cavities. In some respects they resemble subhedral grains commonly seen in gabbroic rocks, with some euhedral, pyramidal terminations.

The CL images (Figure 42a) show a dominantly simple zoned internal structure, though some grains have discordant central areas that may represent inherited components. Thus the external morphology of the grains indicates alteration or modification in contrast to the apparent simple zoned magmatic structure seen in the CL

images. It is however possible that this could have happened late in a magmatic process with the magmatic zircon being modified by late stage hydrothermal or residual magmatic fluids. This process may be considered coeval with the magmatic crystallisation; that is within say a few hundred thousand years or so.

Twenty eight analyses have been made on 20 grains. Nineteen analyses were made in one session that unfortunately had a very poor reference zircon U–Pb calibration; the external error on this session is estimated to be $\pm 1.5\%$. In order to cross-check this poor U–Pb calibration, a number of the grains were re-analysed in a second session. For the most part the analyses reproduce well for those areas that are of similar CL characteristics.

The Tera-Wasserburg concordia plot of the total calibrated ratios shows a dominantly low common Pb content, but significant dispersion in the $^{238}\text{U}/^{206}\text{Pb}$ ratios (and ages). This dispersion is best viewed on the relative probability plot, with stacked histogram. There is a dominant peak, and grouping of analyses at about 300Ma, with a subordinate but prominent peak at about 310–315Ma. A minor peak at about 275–280Ma has only three analyses (9.1, 14.1 and 191.), and this minor younger series of analyses most probably reflects radiogenic Pb loss after the dominant period of zircon crystallisation. These three analyses are located close to cracks or holes in the grains and so radiogenic Pb loss seems most likely.

If the three youngest analyses are excluded (9.1, 14.1 and 191.), a weighted mean of the $^{206}\text{Pb}/^{238}\text{U}$ ages for the other 25 analyses has excess scatter (MSWD = 4.2). These 25 analyses can be subdivided into two groups on the basis of the relative probability plot (also coloured similarly on the Tera-Wasserburg plot). There is an older group of 9 analyses that have a weighted mean $^{206}\text{Pb}/^{238}\text{U}$ age of $315\pm 5.8\text{Ma}$ (external errors, MSWD = 0.78). Analyses 1.2, 3.1 and 7.1 are located closer to the centre of the respective grains. However analysis 8.1 is nearer to the edge on this simple zoned grain, relative to the more centrally located younger analysis 8.2. Grains 10, 15 and 16 yield only older analyses.

The dominant younger group of 16 analyses has a weighted mean $^{206}\text{Pb}/^{238}\text{U}$ age of $298.2\pm 5.1\text{Ma}$ (external errors, MSWD = 0.98).

From the current data-set, the older group at $\sim 315\text{Ma}$ may reflect a slight but significantly older period of magmatic crystallisation, though not all these analyses are of structurally discrete central areas (*e.g.* grain 8). The younger and more dominant group at $\sim 300\text{Ma}$ may be considered to provide the best estimate for the magmatic crystallisation of zircon in this sample.

LHT322: recrystallised rhyolite

South of Glandore homestead, adjacent to Glandore Granodiorite, THEODORE MGA 238846
7244535
(Table 3, Figure 3)

Twenty grains were analysed, all simple magmatic zircon. The whole dataset gives a weighted mean of the $^{206}\text{Pb}/^{238}\text{U}$ age of $323\pm 4.5\text{Ma}$ with an MSWD of 3.6, indicating excess scatter. On a probability density plot with stacked histogram, there appears to be some dispersion about a generally simple Gaussian distribution. Removing three younger grains (1.1, 3.1 and 17.1) with ages from 305–311Ma and two older ones (11.1 and 16.1) with ages of $\sim 338\text{Ma}$, produces an age with effectively no excess scatter of $325\pm 4.0\text{Ma}$ (external errors, MSWD = 1.5). Using the Sambridge & Compston (1994) ‘unmixing’ model, the data in the probability density plot can be resolved into two populations at $\sim 313\text{Ma}$ and 328Ma, but given that the volcanics are intruded by the Glandore Granodiorite dated at $\sim 323\text{Ma}$, it is likely that $325\pm 4.0\text{Ma}$ is close to the crystallisation age.

RSC157: rhyolitic ignimbrite

Eidsvold–Cracow road, CRACOW, MGA 234121 7198220
(Table 4, Figure 4)

Fifteen grains were analysed. The youngest grain (9.1) is discordant and has been excluded. The remaining fourteen analyses have a Gaussian distribution and produce a weighted mean of $308.1\pm 5.1\text{Ma}$ (external errors, MSWD = 2.0).

RSC218A: rhyolitic ignimbrite

Cockatoo Creek near Taroom–Auburn road, BUNGABAN MGA 234400 7153600
(Table 5, Figure 5)

Fifteen analyses were made on twelve grains. The probability density and stacked histogram plot shows that the population includes two older grains (2.2 and 8.1) that probably represent an inherited component at ~330–335Ma, and three younger analyses (1.1, 2.1 and 4.1) with ages in the range 271–289Ma that could be due to Pb loss. One of these young analyses was from one of the inherited grains and another from a grain that also gave an age within the main population. The remaining ten grains produce a weighted mean giving an age of 311.6 ± 3.8 Ma (external errors, MSWD = 0.8), which is considered to be the crystallisation age.

CAMBOON VOLCANICS***BB2535: rhyolitic ignimbrite***

Delusion Creek, CRACOW MGA 227131 7215636
(Table 6, Figure 6)

Sixteen grains were analysed and of these one (3.1) was older at ~337Ma and two (13.1 and 15.1) were younger at 275–283Ma. The remaining thirteen analyses produce a weighted mean of 307.8 ± 5.9 Ma with excess scatter and a MSWD of 2.18 suggesting that the data are not a simple population. Using the Sambridge & Compston (1994) ‘unmixing’ model, the data can be resolved into a dominant population at 309.1 ± 3.3 Ma and a subordinate population at 295.2 ± 6.2 Ma. The significance of such a younger population is not known. Alternatively, taking the weighted mean of eight analyses that fall in the middle of the population produces an age of 308.2 ± 5.0 Ma (external errors, MSWD = 0.55).

IWGG809: crystal-rich rhyolitic ignimbrite

11km north of Rannes, BANANA MGA 206680 7342697
(Table 7, Figure 7)

Fifteen grains were analysed and produced an age of 295.2 ± 2.8 Ma with excess scatter and a MSWD of 1.9. The data can be ‘unmixed’ to produce a dominant population of 297.5 ± 2.6 Ma and a smaller population of four analyses giving 288.5 ± 4.8 Ma. If the three youngest of these analyses are rejected due to suspected radiogenic Pb loss, the remaining twelve produce a weighted average age of 297.1 ± 3.3 Ma (external errors, MSWD = 0.81), which is considered as the best estimate for the magmatic age of the ignimbrite.

AUBURN ARCH AND RAWBELLE BATHOLITH – PLUTONIC ROCKS**BOAM CREEK QUARTZ MONZODIORITE*****LHT540: biotite-hornblende granodiorite***

Road into Kandoona south-east of Mount Appenben, THEODORE MGA 228115 7239385
(Table 8, Figure 8)

Twelve grains were analysed. One grain (4.1) with an age of ~228Ma is clearly anomalous and was rejected from the calculations. Two other grains, 6.1 (with an age of ~333Ma and possibly inherited) and 9.1 (~296Ma) were also excluded. The remaining nine analyses produce a weighted mean of 315 ± 4.0 Ma (external errors, MSWD = 0.74).

COONAMBULA GRANODIORITE

QFG2722: Deformed (gneissic) biotite granite

Target Creek, 9km west of Coonambula, AUBURN MGA 284469 7177150
(Table 9, Figure 9)

Twenty-two analyses were made on twenty-one grains, resulting in a very complex population of ages, consistent with the field relationships of the unit and the abundant metamorphic enclaves and schlieren. Three grains are clearly inherited with ages of ~344–480Ma. The remaining zircons form two distinct populations. One population with nine grains has a mean age of ~320Ma, and the other of seven grains has an age of ~295Ma. The latter population suggests that it is early Permian, with a large inherited 320Ma component from the entrained metamorphic material. It has previously been interpreted as early Carboniferous because of its foliation and the fact that another foliated granite dated herein (Donore Granite Gneiss — sample RSC164A) has an age of ~342Ma. The foliation in the granodiorite itself should be re-examined to determine whether it could be magmatic rather than tectonic.

DONORE GRANITE GNEISS

RSC164A: deformed (gneissic) granite

Eidsvold–Cracow road near St Johns Creek crossing RAWBELLE MGA 276831 7188285
(Table 10, Figure 10)

Unlike the Coonambula Granodiorite, the Donore Granite Gneiss sample has a relatively simple population with only one anomalous, discordant grain (14.1) and one grain (1.1) with a very large error due to abnormally high common Pb. The remaining twelve grains give a weighted average yielding an age of 341.5 ± 3.3 Ma (MSWD = $1.3 \pm$ external error). Removing one slight outlier produces an age with somewhat less scatter and gives an age of 342.5 ± 4.0 Ma (external errors, MSWD = 0.87) which is considered to be the best estimate of the crystallisation age of the granite.

EVANDALE TONALITE

IRAU481: hornblende biotite tonalite

South bank of Auburn River north-east of Evandale homestead, AUBURN MGA 254700 7154700
(Table 11, Figure 11)

Unfortunately, only a hard copy report of the original data was available for this sample at the time of publication. However, according to that report, seventeen grains were analysed and the non-‘squidged’ data as reproduced in Table 11 showed excess scatter with an MSWD of ~3. One grain (9.1) was identified as clearly an inherited grain at ~360Ma and one younger grain (6.1) at ~298Ma may reflect Pb loss. Arbitrarily trimming the rest of the population produced a mean age of 319 ± 7 Ma (MSWD = 1.72). However, the data were run through ISOPLOT by Dr Chris Carson at Geoscience Australia and applying the Sambridge & Compston (1994) ‘unmixing’ model suggested a complex population. Three populations are evident, one represented by the single inherited grain at ~360Ma and two others at about 325Ma and 300Ma. Although these ages are imprecise, like the Coonambula Granodiorite, the Evandale Tonalite may be late Carboniferous or early Permian with a significant inherited early Carboniferous component of similar the age to the Glandore Granodiorite below.

GLANDORE GRANODIORITE

RSC137: hornblende-biotite granodiorite

Near Glandore homestead, THEODORE MGA 24412 7248110
(Table 12, Figure 12)

Fifteen grains were analysed and produced a broad approximately Gaussian distribution with excess scatter yielding a weighted average of 322.5 ± 3.5 Ma (MSWD = 2.6). Excluding three grains that are outside error of this mean, the oldest (4.1) and two youngest (5.1 and 12.1), changes the weighted mean only slightly but

improves the scatter and gives a best estimate of 323.4 ± 3.9 Ma (external errors, MSWD = 1.4) for the crystallisation age of the Glandore Granodiorite.

WIDBURY GRANITE

QFG2732: biotite granite

South of Widbury homestead, AUBURN MGA 293936 7183354
(Table 13, Figure 13)

The zircons from this sample are relatively clear, elongate grains with a few larger more equant grains. Bipyrarnidal terminations are dominant, though in transmitted light a few grain margins appear to have been modified by post crystallisation processes and are subrounded.

The CL images (Figure 42b) reveal a far more complicated internal structure to these grains than is evident from the transmitted light photomicrographs. Whilst the grains can be seen to have simple magmatic zoning, most have a thin outer rim that is $<10\mu\text{m}$ in width and so too narrow to be analysed with the normal $\sim 20\text{--}30\mu\text{m}$ SHRIMP spot.

Fifteen grains were analysed. On the Tera-Wasserburg plot it is not surprising to see a dispersed cluster of analyses that is further highlighted on the relative probability plot. There is however a dominant group at ~ 290 Ma with subordinate older concentrations at ~ 310 Ma and near 330 Ma. Analysis 7.1 appears to be a single younger analysis at ~ 278 Ma and the area analysed may have lost radiogenic Pb.

A weighted mean of the $^{206}\text{Pb}/^{238}\text{U}$ ages for the nine analyses forming the dominant age grouping gives 290.4 ± 4.9 Ma (external errors, MSWD = 2.0). This most probably records the timing of the major magmatic crystallisation event in this sample. However the age of the rims is not known, nor is the effect their formation may have had on the older magmatic component. The euhedral outline of most grains and bipyrarnidal terminations suggest that the thin rims evident under CL could have formed late in the magmatic process, and so it is possible that their age is effectively within error of that for the major zoned magmatic zircon.

WINGFIELD GRANITE

QFG2591: hornblende-biotite granite

Nogo River, near Old Rawbelle homestead SCORIA MGA 282768 7228923
(Table 14, Figure 14)

The zircons from this sample are relatively clear, equant to elongate grains with pyramidal or bipyrarnidal terminations. Under transmitted light, magmatic zoning is clearly evident in some grains and a few have gas vapour trails consistent with a high crustal level of crystallisation; *i.e.* a subvolcanic paragenesis. The CL images (Figure 42c) reveal a dominantly simple zoned igneous interior. The zoning may have discontinuities, with zoned “cores” and zoned “rims” in semicontinuous subparallel agreement.

Twenty grains have been analysed. On the Tera-Wasserburg concordia plot the analyses form a dominant concordant cluster, with two analyses being more enriched in common Pb and one analysis trailing off with a younger $^{206}\text{Pb}/^{238}\text{U}$ age.

On a relative probability plot with stacked histogram the analyses do not form a simple bell curve. Rather the curve is very broad at its peak and possibly reflects the presence of two closely spaced age “peaks”. The analysis for grain 17 is significantly older (radiogenic $^{206}\text{Pb}/^{238}\text{U}$ age is ~ 265 Ma) and considered an outlier. The area analysed is more enriched in common Pb than the others and it is possible that this is either an older zircon component, or that the common Pb correction applied does not take into account the correct composition of that common Pb. The analysis of grain 12 is slightly younger as noted on the Tera-Wasserburg plot, and it is probable that the area analysed has lost radiogenic Pb.

A weighted mean of the $^{206}\text{Pb}/^{238}\text{U}$ ages for the other eighteen analyses has some excess scatter (MSWD = 2.7) giving 251.1 ± 3.6 Ma (external errors,). It may be possible to arbitrarily cull other analyses from this weighted mean calculation. However, the CL images show a dominant magmatic zonation and whilst there may be some older cores, the areas analysed are from the tips or “rims” of grains and so would be

expected to yield the magmatic age. From the current data-set, the weighted mean for 18 of 20 analyses is considered to provide the best estimate for the crystallisation age of this sample.

CONNORS ARCH – VOLCANIC ROCKS

CLIVE CREEK VOLCANICS

RSC093: crystal-rich, lithic-poor rhyolitic ignimbrite

Old Bruce Highway near Mount Mackenzie, MOUNT BLUFFKIN MGA 749770 7470770
(Table 15, Figure 15)

Fourteen grains were analysed and two (4.1 and 6.1) are somewhat older than the main population and are excluded from the calculations. They have ages of ~370Ma and ~377Ma and are probably inherited. On the Tera-Wasserburg plot, grain 1.1 at ~332Ma appears to be an outlier from the main population and is also excluded. The remaining eleven grains give a weighted mean of 348.9 ± 4.8 Ma (external errors, MSWD = 1.3).

BROADSOUND RANGE RHYOLITE

IWSC0323: crystal-rich rhyolite ignimbrite

East of Mount Mackenzie, MOUNT BLUFFKIN MGA 754791 7468649
(Table 16, Figure 16)

The zircons from this sample are dominantly elongate, clear, euhedral grains. Most have at least one pyramidal termination. Some have cavities interpreted to be trapped gas vapour trails, usually seen in high level intrusions and sub-volcanic/volcanic settings. The CL images show a simple zoned magmatic internal structure (Figure 42d). There are some discontinuities, and these may reflect inherited components. However, for the most part these apparent “cores” were not analysed in this study.

Twenty grains have been analysed. Apart from the analysis of grain 6, the euhedral tips to grains were analysed in an attempt to define the magmatic age. The analyses have low common Pb and form a dispersed cluster on the Tera-Wasserburg concordia plot. On a relative probability plot with stacked histogram, the analyses can be seen to form a distorted major peak with tails trailing off to both younger and older ages. From the histogram it can be suggested that there are two older and three younger analyses giving rise to this distorted probability curve.

The analyses of grains 6 and 9 yield older analyses (6.1 at ~340Ma and 9.1 at ~330Ma). These may be interpreted to reflect older zircon components, although from the CL images they were not interpreted to be clearly older. The three younger analyses, 1.1, 14.1 and 17.1 are all just slightly younger than ~300Ma. These are all interpreted to be analyses of areas that have lost radiogenic Pb. The five analyses are highlighted on both the Tera-Wasserburg and relative probability plots.

A weighted mean of the $^{206}\text{Pb}/^{238}\text{U}$ ages for the remaining 15 analyses has some excess scatter (MSWD = 2.2) giving an age of 313.8 ± 3.2 Ma (external errors). This is currently the best estimate for the magmatic crystallisation age of the zircon in this sample.

IWSC0669: slightly hornfelsed crystal-rich ignimbrite (intruded by Bora Creek Quartz Monzodiorite)

South of Mount Larry, MOUNT BLUFFKIN MGA 751535 7482339
(Table 17, Figure 17)

Relatively large elongate zircons with pyramidal terminations dominate this population. Rare gas vapour trails are present. The CL images show mostly simple magmatic zoning throughout, although minor inherited cores may be present.

Eighteen analyses were made on seventeen grains. One area analysed, 15.1 is relatively more enriched in common Pb than the others which are mostly on or near concordia. In detail, some are interpreted to have

suffered radiogenic Pb loss (analyses 9.1, 10.1 and 14.1) and one area is slightly older (analysis 17.1). Excluding these analyses, a preferred weighted mean gives 308.4 ± 3.3 Ma (external errors, MSWD = 1.16).

Geologically, this age is somewhat problematic, because it is younger (and outside error) than the weighted average age of 316.4 ± 3.4 Ma obtained for the Bora Creek Quartz Monzodiorite which is interpreted to intrude it (see IWSC0601).

WHELAN CREEK VOLCANICS

LHC927: crystal-rich rhyolitic ignimbrite

East of Dacey – Killarney road, south of Dacey, CONNORS RANGE MGA 734147 7540576 (Table 18, Figure 18)

The zircons from this sample are relatively clear, equant to elongate grains. Many have pyramidal, or bipyramidal terminations and a few have discordant centres clearly visible under transmitted light. The CL images (Figure 42e) reveal a dominantly zoned igneous interior, but many grains are structured, with clearly discordant zoned centres overgrown by mostly lighter zoned rims. The CL images reveal many potential complications in the U–Pb age determinations for this sample, and the areas analysed were restricted to relatively simple grains with zoned rims.

Seventeen grains were analysed. Grain 5 was selected as being likely to yield an older age and the $^{206}\text{Pb}/^{238}\text{U}$ age of ~ 975 Ma is not unexpected (see Tera-Wasserburg plot of all analyses).

On the Tera-Wasserburg concordia plot of the younger analyses, there is considerable dispersion in calculated ages that is further highlighted on the relative probability plot. The analyses of grains 9 and 17 are significantly older than a general prominent group at ~ 320 Ma, the former having $^{206}\text{Pb}/^{238}\text{U}$ ages of ~ 345 Ma and ~ 355 Ma respectively.

Three analyses are younger than the prominent grouping. Analyses 11.1, 15.1 and 16.1 yield $^{206}\text{Pb}/^{238}\text{U}$ ages between 290 Ma and 300 Ma. The CL and transmitted light photomicrographs of those areas are not remarkably different from others in the ~ 320 Ma grouping, but it is suggested that these areas have lost small amounts of radiogenic Pb.

A weighted mean of the $^{206}\text{Pb}/^{238}\text{U}$ ages for the other eleven analyses has some excess scatter (MSWD = 2.4) about a mean of ~ 318 Ma. On the relative probability plot it can be seen that this ~ 318 Ma group may in fact be comprised of two closely spaced overlapping age peaks. If three slightly older analyses at ~ 327 – 328 Ma are excluded (analyses 3.1, 4.1 and 13.1) the remaining eight analyses give a weighted mean of 314.1 ± 5.0 Ma (external errors, MSWD = 1.3). This is considered to provide the best estimate for the crystallisation age of the more prominent magmatic zircon in this sample.

TARTRUS RHYOLITE

IWSC0353: crystal-rich rhyolitic ignimbrite

Near UHF repeater, east of Mount McKenzie, MOUNT BLUFFKIN MGA 755952 7466936 (Table 19, Figure 19)

The zircons in this sample are dominantly squat to equant with some more elongate prismatic grains. CL images show simple magmatic zoning to be present in most grains. Some may be structured with different age components but the dominant population can be interpreted as simple zoned magmatic zircon.

Twenty-six analyses were made on twenty-five grains. Analysis 10.1 is higher in U than any of the others and has a much younger $^{206}\text{Pb}/^{238}\text{U}$ ratio. This area is unique for the current series of analyses and the area is interpreted as having lost radiogenic Pb. The second analysis of grain 24 is more enriched in common Pb than all of the other analyses and coincidentally yields the oldest $^{206}\text{Pb}/^{238}\text{U}$ age, significantly older than the initial age of this elongate simple magmatic zoned zircon. Two other younger grains also appear to be outliers and have probably undergone Pb loss.

Excluding these four grains results in a weighted mean of 300.8 ± 4.1 Ma (external errors, MSWD = 1.8) from the remaining twenty-two grains. The population can possibly be 'unmixed' into two populations at ~ 297 Ma

and ~304Ma, but the weighted mean is currently considered the best estimate of the crystallisation age of this ignimbrite sheet.

LOTUS CREEK RHYOLITE

RSC074A: crystal-rich, lithic-poor rhyolitic ignimbrite

Big Codling Creek near Croydon – St Lawrence road, CONNORS RANGE MGA 732290 7520075
(Table 20, Figure 20)

Thirteen grains were analysed from this sample. Two analyses are significantly younger than the main population (7.1 and 12.1, both at ~283Ma) and are excluded from the calculations. The remaining eleven analyses gave a weighted mean of 293 ± 3.4 Ma, but have some excess scatter (MSWD = 2.0). The scatter can be improved by excluding two further analyses whose error ranges fall below the mean. The resulting weighted mean, 295.0 ± 3.4 Ma (external errors, MSWD = 0.85) is considered the best estimate of the crystallisation age.

LEURA VOLCANICS

BB3399: crystal-rich dacitic ignimbrite

East of Nebo Creek, NEBO MGA 674161 7610294
(Table 21, Figure 21)

Twenty-three analyses were made on nineteen grains. One analysis (9.1) had significantly higher common Pb and also had a much older age (~327Ma) than the rest of the population. The weighted mean of the rest of the analyses is 293.2 ± 3.4 Ma, but there is excess scatter (MSWD = 2.7) suggesting more than one population. Applying the Sambridge & Compston (1994) ‘unmixing’ model, suggests populations with means at ~304Ma, ~294Ma and ~280Ma, and the weighted mean plot suggests that there are a number of outliers, both older and younger. Removing three older analyses and two younger ones changes the mean age only slightly to 293 ± 4.0 Ma (external errors), but significantly reduces the scatter (MSWD = 0.85). This is considered the best estimate of the crystallisation age.

IWSC0897: crystal-rich ignimbrite

East of Wahroonga homestead, MOUNT BLUFFKIN MGA 734500 7508950
(Table 22, Figure 22)

The zircons in this sample are dominantly squat to equant with more elongate prismatic grains also present. The CL images show simple magmatic zoning. In the larger, squatter grains, there are thin zoned rims to low U centres which may be inherited components (grain 1)

Twenty-one analyses have been made on twenty grains, and the probability density plot suggests that there are two populations. Applying the Sambridge & Compston (1994) ‘unmixing’ model produces means of ~292Ma and ~308Ma for these populations. The data have been arbitrarily divided into two groups. The oldest group of analyses produces a weighted mean of 307 ± 3.1 Ma (external errors, ± 4.7 MSWD = 1.05) from nine grains and this is interpreted to be an inherited component in the magma. The remaining twelve analyses produce a weighted mean of 291.2 ± 4.2 Ma (external errors, MSWD = 0.5) and this is inferred to be the crystallisation age.

LHC878: hornfelsed rhyolite (thought to be intruded by Doreen Granite — see sample LHC882)

North of Iron Pot Mountain, CONNORS RANGE MGA 716942 7547925
(Table 23, Figure 23)

The zircons are elongate to more equant in outline and some appear to be lozenge shaped. Many have pyramidal terminations and some have gas vapour trails consistent with rapid cooling. The CL images show that simple magmatic zoning is dominant, though some grains have discontinuities in the zoning that may represent significant time breaks during magmatic crystallisation.

Eighteen analyses were done on seventeen grains. One analysis (5.1) is significantly younger at ~264Ma and another is very strongly enriched in common Pb (see Tera-Wasserburg plot of the total ratios) and is excluded from the calculations. The seventeen analyses that form a dominant group show some scatter about a general mean of 291 ± 3.3 Ma (external errors, MSWD = 2.4). Applying the Sambridge & Compston (1994) 'unmixing' model suggests that the data contains two populations with means of ~286Ma and ~296Ma. Omitting five analyses whose error range does not overlap with the above weighted mean produces an alternative estimate of 292.0 ± 3.7 Ma (external errors, MSWD = 1.3).

A problem with this age is that it is younger than and outside error of the age of the Doreen Granite, which is interpreted to intrude the Leura Volcanics within a few metres of the sample site. The Doreen Granite gives an age of 300.9 ± 3.4 Ma (sample LHC882).

CARMILA BEDS

BB3050A: rhyodacitic ignimbrite

Near Koumala, CARMILA MGA 750671 7566261
(Table 24, Figure 24)

Twenty-two analyses were done on nineteen grains. The results give a large spread of values and the probability density plot suggests that the grains are part of a complex population. The data can be 'unmixed' in various ways using the Sambridge & Compston (1994) 'unmixing' model, but the simplest is into two populations. The older arbitrary set of seven analyses (that excludes two analyses older than 310Ma) produces a weighted mean of 305.4 ± 2.9 Ma (external errors, ± 3.4 MSWD = 0.56). These probably record inherited zircon from an older igneous event. The younger set of ten analyses (again excluding three analyses younger than 285Ma, which may have Pb loss) produces a weighted mean of 292.8 ± 3.0 Ma (external errors, MSWD = 0.93). This is considered the best estimate of the crystallisation age of the ignimbrite.

LIZZIE CREEK VOLCANIC GROUP

RSC011: crystal-rich dacitic ignimbrite

North of Eungella Dam, HILLALONG MGA 636475 7667820
(Table 25, Figure 25)

Fourteen grains were analysed from this sample. One analysis (5.1) is anomalously young (~248Ma) and is excluded from the calculation of the weighted mean along with another analysis (6.1) that is also younger than the main population (~268Ma). The remaining twelve analyses give a weighted mean of 284.7 ± 4.4 Ma (external errors, MSWD = 1.16).

CONNORS ARCH – PLUTONIC ROCKS

BURWOOD COMPLEX

IWSC0733: hornblende-biotite granodiorite

North of Burwood, MOUNT BLUFFKIN MGA 745201 7507469
(Table 26, Figure 26)

Relatively equant to slightly elongate blocky grains with pyramidal terminations dominate this population. CL images reveal mostly simple zoned magmatic interiors though some grains have discordant centres that most probably reflect the presence of older components.

Twenty analyses have been made on eighteen grains. Analysis 4.1 is younger than the dominant group and the area may have lost radiogenic Pb. Three analyses (1.1, 7.1 and 17.1) are significantly older than the rest of the population (~340–344Ma) and of these analysis 17.1 is more enriched in common Pb. Excluding these analyses, a weighted mean of sixteen analyses which form the main group has no excess scatter (MSWD = 1.2) giving an age of 328.0 ± 3.8 Ma (external errors).

HAZLEWOOD GRANITE

LHC091: biotite granite

Headwaters of Oaky Creek, south of Carmila, CONNORS RANGE MGA 750900 7560420
(Table 27, Figure 27)

Nineteen grains were analysed from this sample. One grain (11.1) has extremely high common Pb and is excluded from all subsequent discussion. Two other grains appear to be significantly older than the rest of the population at ~385Ma (7.1) and ~407Ma (10.1) and are probably inherited. Another two are significantly younger at ~290Ma and may be due to Pb loss. The remaining 14 grains show a broad spread with several peaks suggesting that there may be multiple populations. Applying the Sambridge & Compston (1994) ‘unmixing’ model to the data highlights the possibility of three populations and suggests a magmatic age of 314.9 ± 3.9 Ma with a significant inherited component at 332.2 ± 3.3 Ma (internal errors only) and another at 347 ± 5.9 Ma.

BORA CREEK QUARTZ MONZODIORITE

IWSC0601: hornblende-biotite quartz monzodiorite

Broadsound Range, MOUNT BLUFFKIN MGA 747231 7485675
(Table 28, Figure 28)

Eighteen grains were analysed from this sample and the probability density plot indicates that these probably comprise at least two populations, although applying the Sambridge & Compston (1994) ‘unmixing’ model to the data highlights the possibility of a third younger set (possibly due to Pb loss).

The data have been arbitrarily divided into two populations. An older set of five grains produces a weighted mean of 329 ± 5 Ma (external errors, MSWD = 0.94) which is probably inherited and corresponds with the age of the Burwood Complex (see sample IWSC0733). Excluding the three youngest ages (<308Ma) produces a weighted average of 316.4 ± 3.4 Ma (external errors, MSWD = 0.54) which is the best estimate for the crystallisation age of the pluton.

This age is somewhat problematic, because it is older (outside error) than the age obtained for a sample of the Broadsound Range Volcanics (308.4 ± 3.3 Ma) collected adjacent to the pluton, and which is interpreted to be intruded by it. It is therefore possible that the younger age highlighted by ‘unmixing’ the data (308.2 ± 6.0 Ma) is a real age and not due to Pb loss. If so, the rock may contain two inherited components.

DACEY GRANITE

LHC585: hornblende-biotite granite

East of Dacey homestead, CONNORS RANGE MGA 734425 7544556
(Table 29, Figure 29)

The zircons from this sample are distinctly equant to slightly elongate, rather than squat. Many have bipyramidal terminations and the grains commonly have inclusions of apatite(?). The CL images (Figure 42f) show strongly zoned internal structure, mostly from the centres to the rims, although there are some discontinuities.

Twenty-one grains were analysed. On the Tera-Wasserburg plot, the data form a very tight cluster close to concordia. The probability density plot indicates that there may be two closely related age populations that overlap. A weighted mean of all twenty-one $^{206}\text{Pb}/^{238}\text{U}$ ages has an excess scatter (MSWD = 32) at ~317Ma.

Applying the Sambridge & Compston (1994) ‘unmixing’ model to the data suggests the presence of two populations at ~312 and ~320Ma. Taking the ten oldest grains produces a weighted mean of 322.0 ± 4.0 Ma (external errors, MSWD = 0.83) and is probably inherited. The ten youngest grains (excluding analysis 3.1 at 307Ma) produce a weighted mean of 313.0 ± 4.0 Ma (external errors, MSWD = 0.71) and this is interpreted as the crystallisation age of the Dacey Granite. It is consistent with the granite intruding the Whelan Creek Volcanics which are of a similar age.

SAMBO GRANITE

LHC216: biotite granite

North of Spring Valley, CONNORS RANGE MGA 746955 7555350
(Table 30, Figure 30)

The zircons from this sample are mostly blocky, equant to elongate grains with bipyramidal terminations, and have fine needle-like and larger apatite(?) inclusions. The CL images (Figure 42g) show zoned centre to rim internal structure with some distinct boundaries between centre and rim areas, although the zonation is continuous and mostly parallel. Grain 18 has two distinct components, but the ages of 18.1 and 18.2 were the same.

Twenty-three analyses were made on twenty-one grains. Analysis 13.1 with a $^{206}\text{Pb}/^{238}\text{U}$ age of $\sim 353\text{Ma}$ is significantly older than all other analyses and is thus inherited. The other analyses form a relatively simple bell curve on the probability density plot and a weighted mean excluding the slightly older analysis of grain 20 ($\sim 326\text{Ma}$) gives $314.3 \pm 3.8\text{Ma}$ (external errors, MSWD = 1.4). Arbitrarily excluding another four analyses only changes the age slightly to $314.8 \pm 3.8\text{Ma}$ (external errors, MSWD = 1.4). Thus the crystallisation age of the zircon in this sample is $314 \pm 4\text{Ma}$.

DOREEN GRANITE

LHC882: Hornblende-biotite quartz monzonite

Marble Tree Creek, near Doreen, CONNORS RANGE MGA 717374 7546350
(Table 31, Figure 31)

Eighteen analyses were made on sixteen grains. Most of the analyses form a tight cluster near the concordia in the Tera-Wasserburg plot. Two analyses are older than the main cluster ($\sim 314\text{Ma}$ and $\sim 318\text{Ma}$) and three are younger ($\sim 280\text{--}281\text{Ma}$) and are excluded from the weighted mean calculation which gives an age of $300.9 \pm 3.4\text{Ma}$ (external errors, MSWD = 1.4).

This age is problematic as it is older than the age of the Leura Volcanics which it is interpreted as intruding, and thus needs further investigation to resolve. It is possible, although probably unlikely, that the zircons are all mostly inherited or crystallised during a previous event, and that the three 'young' zircons represent the actual age (early Permian, like the Whitehorse Granite — see below).

WHITEHORSE GRANITE

QFG4511A: biotite granite

Whitehorse Mountains, MIRANI MGA 696563 7621504
(Table 32, Figure 32)

The zircons from this sample are dominantly euhedral, elongate crystals, many with pyramidal terminations. The grains are relatively small and although mostly clear, many are crazed/cracked internally and often contain abundant needle-like inclusions of ?apatite. The CL images (Figure 42h) show a variety of internal structures that are dominated by magmatic zonation. There is a wide range in CL response, presumably reflecting a similar range in U and Th concentration and perhaps different magma/fluid components — *e.g.* grains 15 and 14.

Nineteen grains were analysed. On the Tera-Wasserburg concordia plot most of the data forms a coherent group that is near to concordant (data plotted uncorrected for common Pb). Analysis 1.1 is slightly more enriched in common Pb. Analyses 15.1 and 16.1 appear to be slightly older, whereas analysis 10.1 is younger. There are no particular morphological or CL features that distinguish these areas analysed from the others. The relative probability plot with stacked histogram shows a very narrow peak with a larger tail towards the younger side — it is not a simple bell curve which may be a consequence of slight sputtering biases due to the wide variation in U concentrations. Despite this, a weighted mean of 18 of the 19 analyses gives $285.0 \pm 2.4\text{Ma}$ with an MSWD of 2.8 (the younger analysis 10.1 is rejected). If the two older analyses 15.1 and 16.1 are also excluded then the weighted mean is $285.0 \pm 3.7\text{Ma}$ (external errors, MSWD = 1.6). This provides the best estimate for the crystallisation age of the widely varying U rich zircons from sample QFG 4511A.

YARROL PROVINCE – VOLCANIC ROCKS

CHARON POINT RHYOLITE MEMBER***IWSC1278: crystal-rich rhyolite ignimbrite***

South of Charon Point, SAINT LAWRENCE MGA 789510 7520771
(Table 33, Figure 33)

The zircons from this sample are dominantly equant to slightly elongate, euhedral grains. Most have at least one pyramidal termination. The grains are clear apart from inclusions of apatite and some dark cavities. Many of the grains have thin cracks. The CL images (Figure 42i) show a simple zoned magmatic internal structure. There are some discontinuities, for example in grains 3 and 6, although these may simply represent chemical changes in an otherwise single magmatic crystallisation episode.

Eighteen grains were analysed. The analyses have low common Pb and form a relatively simple cluster on the Tera-Wasserburg concordia plot. On a relative probability plot with stacked histogram, the analyses form a rather broad, distorted bell shaped curve with tails to both the older and younger ends.

Two slightly older analyses (4.1 at ~375Ma and 6.1 at ~370Ma) may be interpreted to reflect older components, though the CL images do not show these areas to be of clearly older zircon. Two slightly younger analyses (5.1 at ~330Ma and 18.1 at ~325Ma) are considered to be of areas that have lost radiogenic Pb. These four analyses are highlighted on both the Tera-Wasserburg and relative probability plots. Excluding them from the weighted average does not change the overall age but significantly reduces the scatter. It produces an age of 351 ± 4.9 Ma (external error, MSWD = 1.5).

ROCKHAMPTON GROUP***MHROYCB: rhyolitic ignimbrite***

Youlambie Creek, MONTA MGA 306854 7260751
(Table 34, Figure 34)

Twenty grains were analysed from this sample. All twenty grains give a weighted mean age of 356.5 ± 3.3 Ma with a MSWD of 1.5. Removing two analyses whose error ranges fall outside this mean reduces the scatter, but does not significantly change the age. The preferred age therefore is 356.8 ± 3.8 Ma (external error, MSWD = 1.05).

YOULAMBIE CONGLOMERATE***MHRO970C: rhyolitic ignimbrite***

Road cutting on Dawson Highway, 25km north-east of Biloela, BILOELA MGA 262661 7319645
(Table 35, Figure 35)

Twelve grains were analysed from this sample. One analysis has slightly higher common Pb but its age is not significantly different from the rest of the population. One grain, 4.1, is somewhat younger and has probably had Pb loss. Excluding this analysis produces a weighted mean of 300.8 ± 3.1 Ma (MSWD = 1.7). Removing two further analyses whose error ranges fall outside this mean reduces the scatter and results in an age of 300.6 ± 2.7 Ma (internal error, MSWD = 0.8).

MHRO971(1): rhyolitic ignimbrite

Road cutting on Dawson Highway, 22km north-east of Biloela, BILOELA MGA 258242 7318366
(Table 36, Figure 36)

Sixteen grains were analysed from this sample. One analysis (12.1) is significantly older at ~348Ma and is presumed to be inherited. Excluding this analysis produces a weighted mean of 302.7 ± 3.0 Ma (MSWD = 1.9). Removing two further analyses whose error ranges fall outside this mean reduces the scatter and results in an age of 303.6 ± 3.7 Ma (external error, MSWD = 1.3).

MHRO971(2): rhyolitic ignimbrite

(Table 37, Figure 37)

Fifteen grains were analysed from this sample. One inherited grain (11.1) is very much older at ~1252Ma. Excluding this analysis produces a weighted mean of 299.5 ± 3.3 Ma (MSWD = 2.3). Removing three further outliers reduces the scatter and results in an age of 300.0 ± 3.8 Ma (internal error, MSWD = 1.3).

MHRO971(3): rhyolitic ignimbrite

(Table 38, Figure 38)

Fourteen grains were analysed from this sample. One analysis (14.1) is slightly older than the rest of the population at ~321Ma and is presumed to be inherited. Excluding this analysis produces a weighted mean of 303.3 ± 3.0 Ma (MSWD = 1.8). Removing two further analyses whose error ranges fall outside this mean reduces the scatter and results in an age of 303.1 ± 3.4 Ma (external error, MSWD = 0.91).

GLENPRAIRIE BEDS***IWSC1304: feldspar-phyric rhyolitic ignimbrite***

North-west of Bald Hills homestead, SAINT LAWRENCE MGA 792384 7512373

(Table 39, Figure 39)

The zircons are very clear equant to elongate grains with pyramidal terminations. Some grains have gas vapour trails. The CL images show simple magmatic zoning is dominant, though some have discontinuities in the zoning that may have represented significant time breaks during magmatic crystallisation.

Eighteen analyses were made on seventeen grains. All analyses are near to concordant as measured, but form a dispersed group at ~290–300Ma. Analysis 3.1 may be slightly older at ~320Ma and analyses 2.2, 12.2 and 17.1 are younger at ~278Ma. A weighted mean for all 18 analyses has excess scatter at 292.8 ± 3.9 Ma (MSWD = 4.5), but if the above 4 analyses are excluded the MSWD is 1.2 with an age of 294.3 ± 3.6 Ma (external error).

CRETACEOUS IGNEOUS PROVINCE**WHITSUNDAY VOLCANICS*****RSC026A (originally mapped as Campwyn Volcanics): rhyolitic ignimbrite***

Slade Point, MACKAY, MGA 731000 7669000

(Table 40, Figure 40)

Eighteen grains were analysed and form a tight population. The data form a simple bell curve on the relative probability plot with stacked histogram, although the slightly younger analysis (18.1 at ~131.2Ma) may have Pb loss and is excluded from the weighted mean calculation. This gives an age of 137.5 ± 1.4 Ma (external errors, MSWD = 0.89).

BEN MOHR IGNEOUS COMPLEX***QFG3672: fine-grained hornblende-biotite granodiorite***

North side of Ben Mohr, MACKAY MGA 693960 7647840

(Table 41, Figure 41)

The zircons from this sample range from elongate to more equant shapes, many with pyramidal terminations. Some of the more elongate grains, and fragments of such grains, contain internal cavities or gas vapour trails interpreted to indicate crystallisation in a volcanic to sub-volcanic setting. CL images of the sectioned zircons

(Figure 42j) show a dominant simple magmatic internal structure, prismatic grains having parallel internal zonation.

Twenty one grains were analysed. Analysis 15.1 is significantly enriched in common Pb, and on the enlarged Tera-Wasserburg plot it can be seen that analyses 3.1 and 6.1 also have elevated levels of common Pb. Despite the high common Pb, the calculated radiogenic ratios for these three analyses are within uncertainty of the dominant group. Most of the analyses form a near to concordant simple cluster. Analyses 8.1 and 12.1 appear to be slightly younger at ~127Ma and 124Ma respectively. A skewed “bell curve” is evident on the relative probability plot with stacked histogram. The data are skewed to the younger side interpreted to reflect some radiogenic Pb loss. A weighted mean of the $^{206}\text{Pb}/^{238}\text{U}$ ages that rejects the two younger analyses (8.1 and 12.1) has no excess scatter (MSWD = 1.13) giving an age of $131.8 \pm 1.6\text{Ma}$ (external errors). This is interpreted as the crystallisation age for the dominantly simple zoned magmatic zircon in this sample.

REFERENCES

- ALLEN, C.M., WILLIAMS, I.S., STEPHENS, C.J. & FIELDING, C.R., 1998: Granite genesis and basin formation in an extensional setting: the magmatic history of the northernmost New England Orogen. *Australian Journal of Earth Sciences*, **45**, 875–888.
- COMPSTON, W., WILLIAMS, I.S., KIRSCHVINK, J.L., ZHANG, Z. & MA, G., 1992: Zircon U–Pb ages for the Early Cambrian time-scale. *Journal of the Geological Society of London*, **149**, 171–184.
- HUTTON, L.J., WITHNALL, I.W., BULTITUDE, R.J., von GNIELINSKI, F.E. & LAM, J.S., 1999a: South Connors Auburn Gogango Project: progress report on investigations during 1998. *Queensland Geological Record*, **1999/7**.
- HUTTON, L.J., WITHNALL, I.W., RIENKS, I.P., BULTITUDE, R.J., HAYWARD, M.A., von GNIELINSKI, F.E., FORDHAM, B.G. & SIMPSON, G.A., 1999b: A preliminary Carboniferous to Permian magmatic framework for the Auburn and Connors Arches, central Queensland. In Flood, P.G. (Editor): *Regional geology, tectonics and metallogenesis, New England Orogen*. Earth Sciences, University of New England, Armidale, NSW, 223–232.
- LUDWIG K. R., 1999: User’s manual for Isoplot/Ex, Version 2.10, A geochronological toolkit for Microsoft Excel. *Berkeley Geochronology Center Special Publication 1a*.
- LUDWIG, K. R., 2000: SQUID 1.00, A User's Manual. *Berkeley Geochronology Center Special Publication*, No. 2. 2455 Ridge Road, Berkeley, CA 94709, USA.
- PACES, J.B. & MILLER, J. D., 1993: Precise U–Pb ages of Duluth Complex and related mafic intrusions, north-eastern Minnesota: Geochronological insights to physical, petrogenetic, paleomagnetic, and tectonomagmatic processes associated with the 1.1 Ga Midcontinent Rift System. *Journal of Geophysical Research*, **98**, 13997–14013.
- SAMBRIDGE, M.S. & COMPSTON, W., 1994: Mixture modeling of multi-component data sets with application to ion-probe zircon ages. *Earth & Planetary Science Letters*, **128**, 373–390.
- TERA, F. & WASSERBURG, G., 1972: U-Th-Pb systematics in three Apollo 14 basalts and the problem of initial Pb in lunar rocks. *Earth and Planetary Science Letters*, **14**, 281–304.
- WHITAKER, W.G., MURPHY, P.R. & ROLLASON, R.G., 1974: Geology of the Mundubbera 1:250 000 Sheet area. *Geological Survey of Queensland, Report 84*.
- WILLIAMS, I. S., 1998: U-Th-Pb Geochronology by Ion Microprobe. In McKibben, M.A., Shanks III, W.C. & Ridley, W.I., (Editors): Applications of microanalytical techniques to understanding mineralizing processes. *Reviews in Economic Geology*, **7**, 1–35.
- WITHNALL, I.W., HUTTON, L.J., RIENKS, I.P., BULTITUDE, R.J., von GNIELINSKI, F.E., LAM, J.S., GARRAD, P.D. & JOHN, B.H., 1998a: South Connors Auburn Gogango Project: progress report on investigations during 1997. *Queensland Geological Record*, **1998/1**.
- WITHNALL, I.W., JOHN, B.H., HUTTON, L.J., LAM, J.S., BULTITUDE, R.J., von GNIELINSKI, F.E., RIENKS, I.P. & GARRAD, P.D., 1997: South Connors Auburn Gogango Project. In Beeston, J.W. (Compiler): *Proceedings of the Queensland Development 1997 Conference, 13–14 November, Brisbane*. Department of Mines and Energy, 57–60.
- WITHNALL, I.W., JOHN, B.H., HUTTON, L.J., RIENKS, I.P., BULTITUDE, R.J., von GNIELINSKI, F.E., LAM, J.S. & GARRAD, P.D., 1998b: South Connors Auburn Gogango Project: Summary of investigations for 1996 and 1997. *Queensland Government Mining Journal*, **99**(June), 14–21.

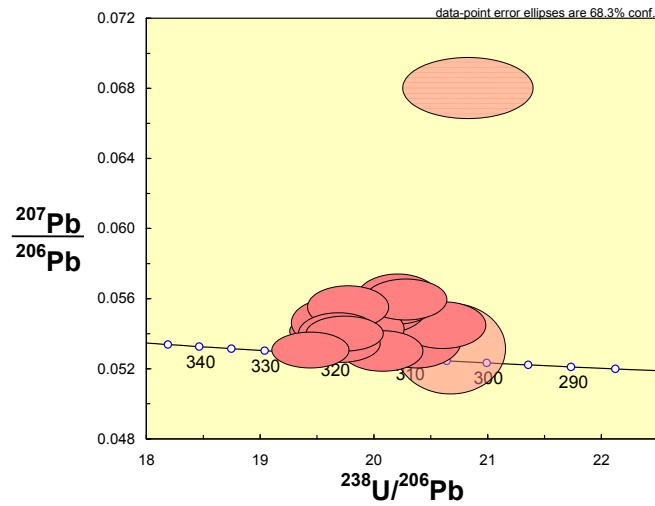
Table 1. Summary of SHRIMP U-Pb zircon analytical data for sample IRAU613
Torsdale Volcanics: rhyolitic ignimbrite, Mount Misery, BUNGABAN, MGA 231700 7135650

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	147	73	0.49	6.4	0.000183	0.23	19.630	0.239	0.0546	0.0009	0.0508	0.0006	319.6	3.9
2.1	229	279	1.22	9.8	-	0.05	20.072	0.233	0.0530	0.0008	0.0498	0.0006	313.3	3.6
3.1	232	165	0.71	10.1	0.000127	0.08	19.699	0.232	0.0534	0.0007	0.0507	0.0006	319.0	3.7
4.1	241	250	1.04	10.6	0.000173	0.02	19.436	0.223	0.0531	0.0007	0.0514	0.0006	323.3	3.7
5.1	113	78	0.69	4.8	0.000328	0.14	20.374	0.258	0.0536	0.0010	0.0490	0.0006	308.5	3.9
6.1	272	293	1.08	11.8	0.000003	0.16	19.738	0.224	0.0540	0.0007	0.0506	0.0006	318.1	3.6
7.1	211	192	0.91	9.1	0.000161	0.27	19.867	0.276	0.0549	0.0008	0.0502	0.0007	315.7	4.3
8.1	45	31	0.69	1.9	-	0.09	20.668	0.321	0.0531	0.0017	0.0483	0.0008	304.3	4.7
9.1	187	134	0.72	7.7	0.001416	1.96	20.822	0.380	0.0680	0.0012	0.0471	0.0009	296.6	5.4
10.1	195	114	0.58	8.3	0.000384	0.35	20.082	0.246	0.0554	0.0009	0.0496	0.0006	312.2	3.8
11.1	222	156	0.70	9.5	0.000021	0.13	20.098	0.312	0.0536	0.0008	0.0497	0.0008	312.6	4.8
12.1	321	563	1.75	14.0	-	0.17	19.669	0.273	0.0541	0.0007	0.0508	0.0007	319.2	4.4
13.1	223	188	0.85	9.7	0.000267	0.15	19.684	0.233	0.0540	0.0008	0.0507	0.0006	319.0	3.7
14.1	234	242	1.04	10.2	0.000342	0.35	19.770	0.235	0.0555	0.0008	0.0504	0.0006	317.0	3.7
15.1	200	138	0.69	8.4	0.000139	0.25	20.602	0.250	0.0545	0.0009	0.0484	0.0006	304.8	3.7
16.1	246	182	0.74	10.6	-	0.20	19.900	0.239	0.0543	0.0008	0.0502	0.0006	315.5	3.7
17.1	267	261	0.98	11.4	0.000054	0.42	20.207	0.241	0.0560	0.0009	0.0493	0.0006	310.1	3.7
18.1	324	270	0.84	13.7	0.000024	0.42	20.277	0.240	0.0560	0.0008	0.0491	0.0006	309.0	3.6

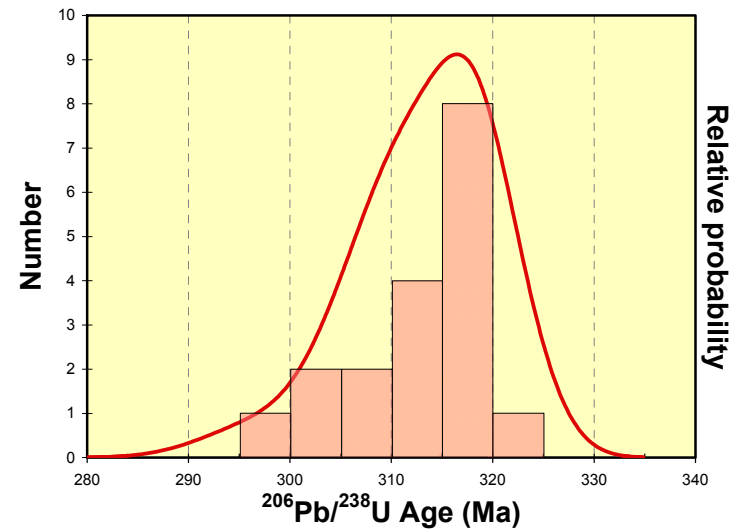
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.68% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age ± no std ± include std
314.9 2.0 2.9

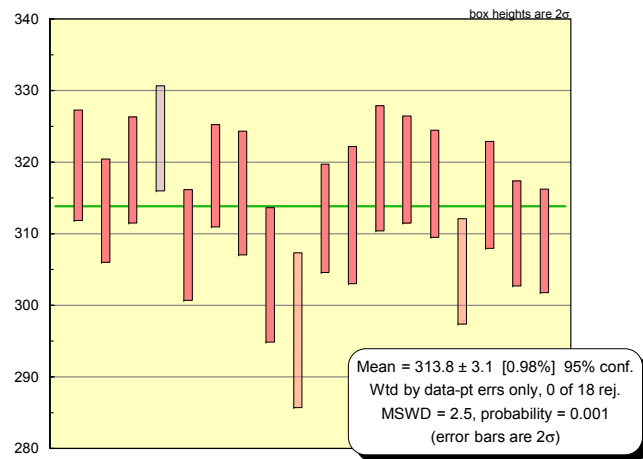
Figure 1. Plots of SHRIMP U-Pb zircon data for sample IRAU613



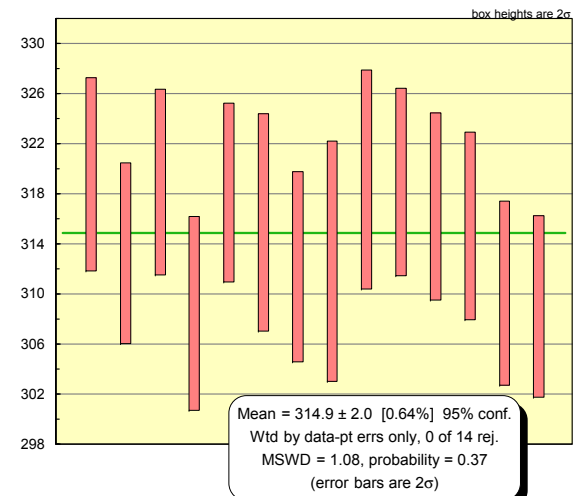
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

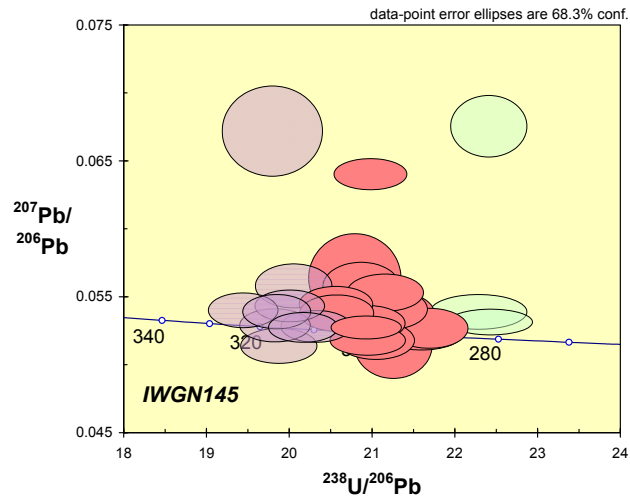
Table 2. Summary of SHRIMP U-Pb zircon analytical data for sample IWGN145
Torsdale Volcanics: crystal-rich rhyolite ignimbrite, Moura Railway, near Banana Range, BANANA, MGA 224328 7295987

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	325	257	0.79	13.4	0.000337	0.10	20.943	0.298	0.0531	0.0009	0.0477	0.0007	300.4	4.2
1.2	300	187	0.62	13.0	0.000339	1.82	19.787	0.401	0.0672	0.0022	0.0496	0.0010	312.2	6.3
2.1	308	224	0.73	12.5	0.000245	<0.01	21.251	0.308	0.0515	0.0016	0.0471	0.0007	296.7	4.3
3.1	297	252	0.85	13.1	0.000081	0.15	19.442	0.276	0.0541	0.0008	0.0514	0.0007	322.8	4.5
4.1	312	192	0.62	13.0	0.000151	0.18	20.566	0.293	0.0539	0.0009	0.0485	0.0007	305.5	4.3
4.2	284	262	0.92	11.7	0.000310	0.44	20.863	0.305	0.0558	0.0012	0.0477	0.0007	300.5	4.3
5.1	<i>spot moved during analysis</i>													
6.1	268	234	0.87	11.0	0.000156	<0.01	21.041	0.305	0.0519	0.0009	0.0476	0.0007	299.5	4.3
6.2	263	223	0.85	10.7	0.000162	0.24	21.201	0.309	0.0542	0.0010	0.0471	0.0007	296.4	4.3
7.1	296	199	0.67	12.8	0.000110	<0.01	19.869	0.303	0.0515	0.0008	0.0504	0.0008	317.0	4.8
7.2	345	248	0.72	14.0	0.000315	0.39	21.155	0.302	0.0554	0.0009	0.0471	0.0007	296.6	4.2
8.1	319	182	0.57	13.8	0.000202	0.03	19.825	0.280	0.0530	0.0008	0.0504	0.0007	317.1	4.4
8.2	244	147	0.60	9.8	0.000110	0.20	21.283	0.309	0.0539	0.0010	0.0469	0.0007	295.4	4.2
9.1	267	176	0.66	10.3	-	0.25	22.281	0.386	0.0540	0.0008	0.0448	0.0008	282.3	4.8
10.1	279	251	0.90	12.0	0.000000	0.22	20.004	0.279	0.0544	0.0008	0.0499	0.0007	313.8	4.3
10.2	426	370	0.87	18.0	0.000309	0.04	20.317	0.282	0.0529	0.0008	0.0492	0.0007	309.6	4.2
11.1	311	250	0.80	12.9	0.000119	0.51	20.788	0.366	0.0565	0.0021	0.0479	0.0009	301.4	5.3
12.1	372	254	0.68	15.2	0.001178	1.47	20.977	0.291	0.0641	0.0008	0.0470	0.0007	295.9	4.0
13.1	543	709	1.31	22.3	-	0.06	20.929	0.283	0.0528	0.0006	0.0478	0.0007	300.7	4.0
14.1	508	555	1.09	19.5	0.001060	1.97	22.405	0.302	0.0676	0.0015	0.0438	0.0006	276.0	3.7
14.2	320	209	0.65	13.4	0.000191	0.26	20.558	0.295	0.0545	0.0009	0.0485	0.0007	305.4	4.3
15.1	307	232	0.76	13.1	0.000300	0.03	20.167	0.278	0.0528	0.0007	0.0496	0.0007	311.9	4.2
16.1	317	269	0.85	13.7	0.000031	0.16	19.842	0.274	0.0540	0.0008	0.0503	0.0007	316.5	4.3
16.2	284	195	0.69	12.2	-	0.40	20.050	0.301	0.0559	0.0011	0.0497	0.0008	312.5	4.6
17.1	319	277	0.87	13.1	-	<0.01	20.944	0.302	0.0519	0.0007	0.0478	0.0007	300.9	4.3
18.1	259	141	0.54	10.3	0.000121	0.03	21.594	0.331	0.0524	0.0008	0.0463	0.0007	291.7	4.4
18.2	161	81	0.50	6.5	-	0.12	21.300	0.339	0.0532	0.0013	0.0469	0.0008	295.4	4.7
19.1	462	412	0.89	17.7	0.000151	0.16	22.424	0.334	0.0532	0.0006	0.0445	0.0007	280.8	4.1
20.1	272	163	0.60	10.8	0.000101	0.08	21.686	0.312	0.0527	0.0010	0.0461	0.0007	290.4	4.1

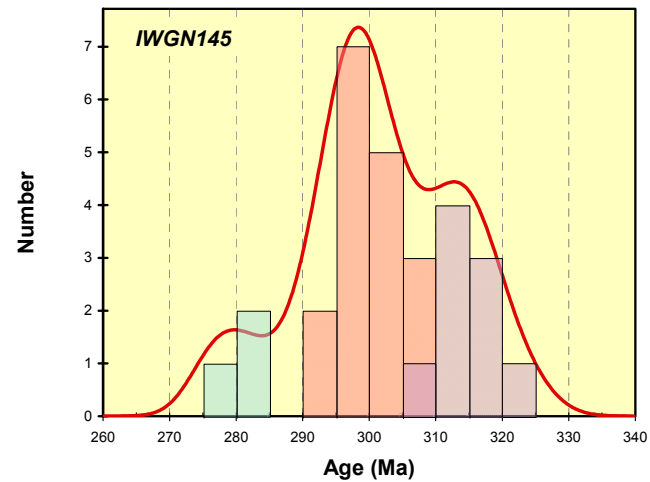
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 1.5% and 0.45% for the two analytical sessions (not included in above errors but required when comparing data from different mounts).
 3. f_{206} % denotes the percentage of ^{206}Pb that is common Pb.
 4. Correction for common Pb made using the measured $^{238}\text{U}/^{206}\text{Pb}$ and $^{207}\text{Pb}/^{206}\text{Pb}$ ratios following Tera & Wasserburg (1972) in as outlined in Williams (1998).

	Age	\pm no std	\pm include std
older	315.0	3	5.8
younger	298.2	2.1	5.1

Figure 2. Plots of SHRIMP U-Pb zircon data for sample IWGN145

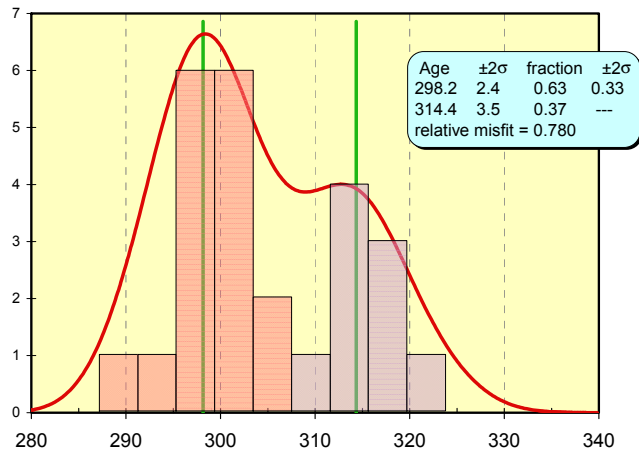


(a) Tera-Wasserburg plot, all analyses

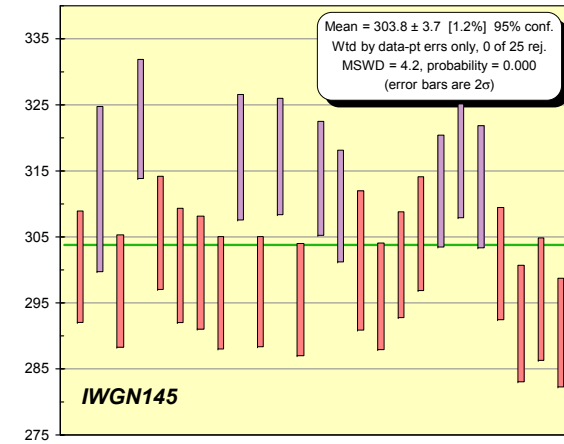


(b) Probability density plot – all grains

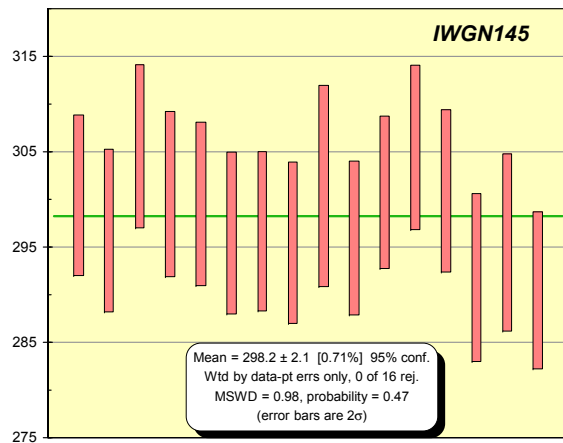
Figure 2 (continued). Plots of SHRIMP U-Pb zircon data for sample IWGN145



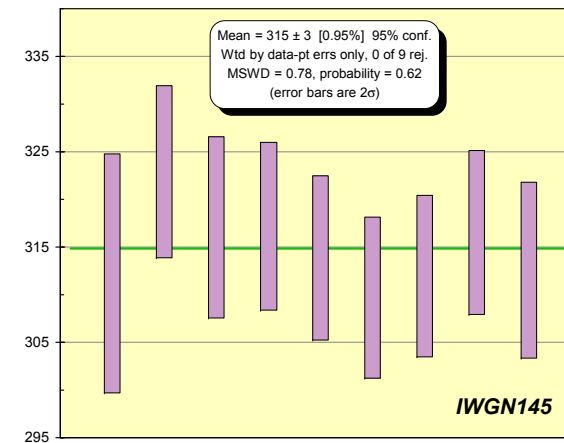
(c) Probability density plot – unmixed



(d) Weighted average all grains



(e) Weighted average dominant group



(f) Weighted average older group

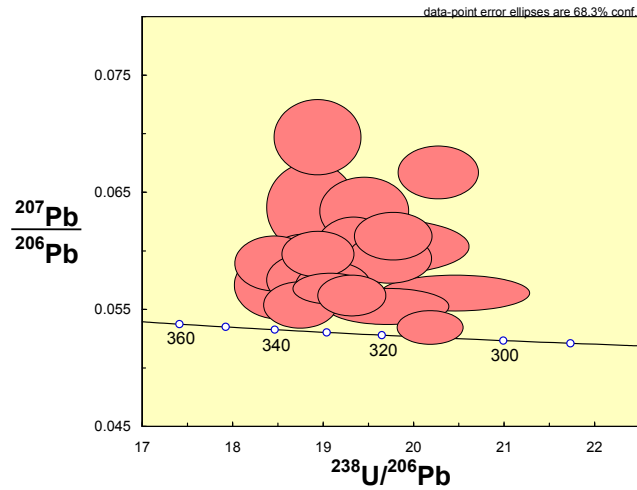
Table 3. Summary of SHRIMP U-Pb zircon analytical data for sample LHT322
Torsdale Volcanics: recrystallised rhyolite. South of Glandore homestead, adjacent to the Glandore Granodiorite, THEODORE, MGA 238846 7244535

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	223	152	0.68	9.5	0.001084	1.77	20.268	0.294	0.0667	0.0015	0.0485	0.0007	305.1	4.4
2.1	179	190	1.06	8.2	0.000605	0.70	18.772	0.276	0.0587	0.0018	0.0529	0.0008	332.3	4.9
3.1	451	244	0.54	19.2	0.000183	0.11	20.179	0.242	0.0535	0.0009	0.0495	0.0006	311.5	3.7
4.1	319	162	0.51	14.2	0.000241	0.41	19.310	0.249	0.0562	0.0011	0.0516	0.0007	324.2	4.1
5.1	102	49	0.48	4.7	0.000211	1.33	18.863	0.325	0.0637	0.0025	0.0523	0.0009	328.7	5.7
6.1	118	93	0.79	5.3	0.003399	2.09	18.933	0.316	0.0697	0.0021	0.0517	0.0009	325.0	5.5
7.1	217	183	0.84	9.9	0.000494	0.83	18.939	0.262	0.0597	0.0013	0.0524	0.0007	329.0	4.5
8.1	182	75	0.41	8.1	0.000673	0.89	19.328	0.282	0.0600	0.0019	0.0513	0.0008	322.4	4.7
9.1	209	117	0.56	9.1	0.000461	1.06	19.769	0.282	0.0612	0.0013	0.0500	0.0007	314.8	4.5
10.1	193	98	0.51	8.4	0.000300	0.82	19.728	0.305	0.0593	0.0014	0.0503	0.0008	316.2	4.9
11.1	137	69	0.50	6.4	0.000245	0.48	18.507	0.329	0.0571	0.0019	0.0538	0.0010	337.7	6.0
12.1	193	107	0.55	8.5	0.000464	1.32	19.448	0.324	0.0634	0.0019	0.0507	0.0009	319.1	5.3
13.1	287	226	0.79	13.1	0.000454	0.28	18.741	0.266	0.0554	0.0013	0.0532	0.0008	334.2	4.7
14.1	211	172	0.82	9.6	0.000416	0.55	18.795	0.283	0.0575	0.0015	0.0529	0.0008	332.4	5.0
15.1	231	171	0.74	10.4	0.000732	0.49	19.106	0.276	0.0569	0.0014	0.0521	0.0008	327.3	4.7
16.1	217	109	0.50	10.1	0.000850	0.71	18.452	0.288	0.0589	0.0016	0.0538	0.0009	337.9	5.2
17.1	561	317	0.57	23.6	0.000184	0.49	20.454	0.542	0.0564	0.0010	0.0487	0.0013	306.2	8.0
18.1	645	279	0.43	28.1	0.000114	0.31	19.706	0.449	0.0552	0.0010	0.0506	0.0012	318.1	7.2
19.1	231	131	0.57	10.1	0.000837	0.95	19.607	0.661	0.0604	0.0016	0.0505	0.0017	317.7	10.6
20.1	583	669	1.15	26.3	0.000135	0.47	19.074	0.273	0.0568	0.0009	0.0522	0.0008	327.9	4.6

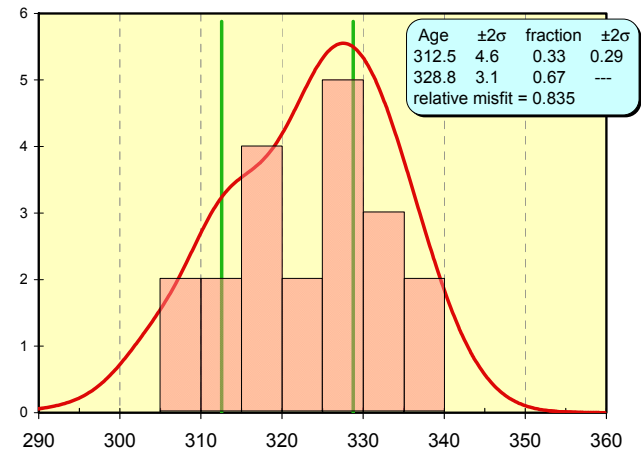
- Notes: 1. Uncertainties given at the one σ level.
2. Error in AS3 reference zircon calibration was 0.58% for the analytical session (not included in above errors but required when comparing data from different mounts).
3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age ± no std ± include std
325.2 3.5 4.0

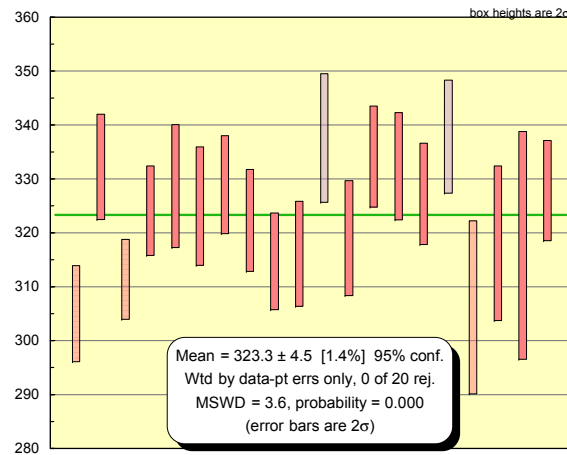
Figure 3. Plots of SHRIMP U-Pb zircon data for sample LHT322



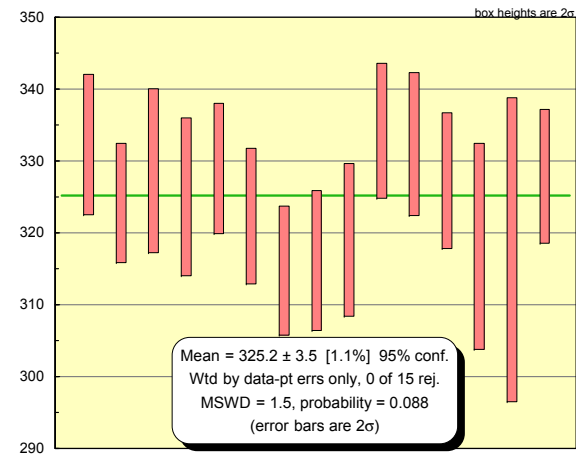
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains with ‘unmixed’ values



(c) Weighted average – all grains



(d) Weighted average – best estimate

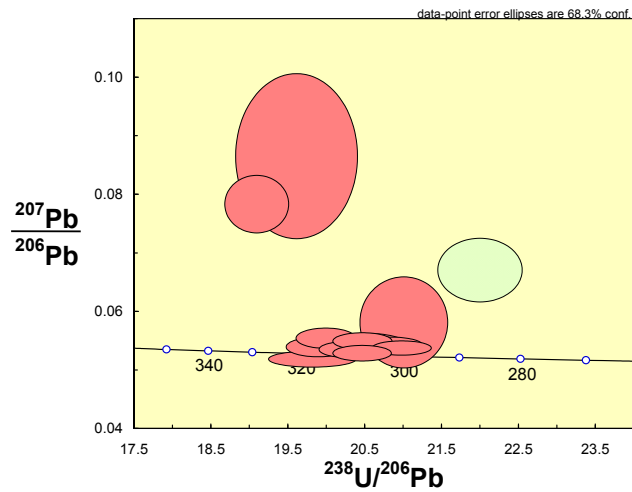
Table 4. Summary of SHRIMP U-Pb zircon analytical data for sample RSC157
Torsdale Volcanics: rhyolitic ignimbrite. Eidsvold-Cracow road, CRACOW, MGA 234121 7198220

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	567	323	0.57	24.0	0.000525	0.23	20.273	0.335	0.0544	0.0011	0.0492	0.0008	309.7	5.1
2.1	457	275	0.60	19.2	0.000440	0.30	20.462	0.255	0.0549	0.0009	0.0487	0.0006	306.7	3.8
3.1	161	99	0.61	7.3	0.002049	3.18	19.085	0.274	0.0783	0.0032	0.0507	0.0008	319.0	4.9
4.1	868	803	0.93	36.5	0.000262	0.12	20.421	0.578	0.0535	0.0012	0.0489	0.0014	307.8	8.6
5.1	417	370	0.89	18.1	-	<0.01	19.808	0.374	0.0518	0.0009	0.0505	0.0010	317.8	5.9
6.1	455	541	1.19	19.6	0.000228	0.15	19.883	0.275	0.0539	0.0011	0.0502	0.0007	315.9	4.3
7.1	362	468	1.29	15.8	0.001145	4.23	19.604	0.521	0.0865	0.0093	0.0489	0.0015	307.5	9.0
8.1	432	506	1.17	18.3	0.000296	0.12	20.284	0.255	0.0535	0.0009	0.0492	0.0006	309.9	3.8
9.1	642	321	0.50	25.1	-	1.88	21.992	0.361	0.0670	0.0036	0.0446	0.0008	281.4	4.8
10.1	578	342	0.59	23.7	0.000236	0.18	20.972	0.253	0.0537	0.0008	0.0476	0.0006	299.8	3.6
11.1	529	487	0.92	22.2	0.000208	0.04	20.461	0.252	0.0529	0.0009	0.0489	0.0006	307.5	3.7
12.1	509	483	0.95	21.0	-	0.22	20.839	0.273	0.0542	0.0010	0.0479	0.0006	301.5	3.9
13.1	403	422	1.05	16.5	0.000061	0.73	21.002	0.378	0.0581	0.0051	0.0473	0.0009	297.7	5.6
14.1	443	457	1.03	18.5	0.000329	0.22	20.537	0.336	0.0542	0.0013	0.0486	0.0008	305.8	5.0
15.1	451	468	1.04	19.4	-	0.34	19.986	0.255	0.0554	0.0011	0.0499	0.0006	313.7	4.0

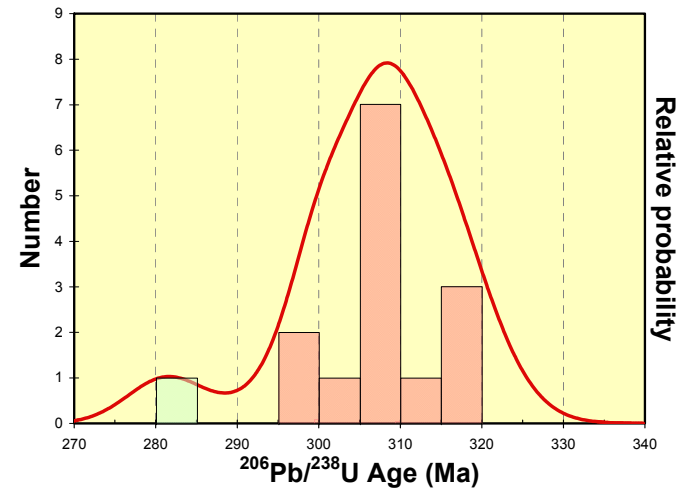
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.77% & 0.86% for the two analytical sessions. (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	± no std	± include std
308.1	3.7	5.1

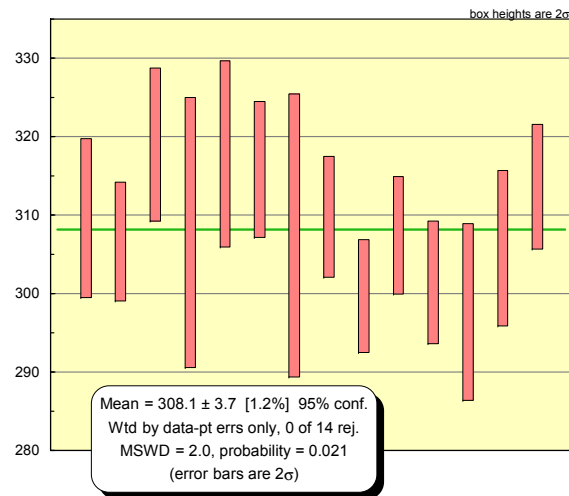
Figure 4. Plots of SHRIMP U-Pb zircon data for sample RSC157



(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains

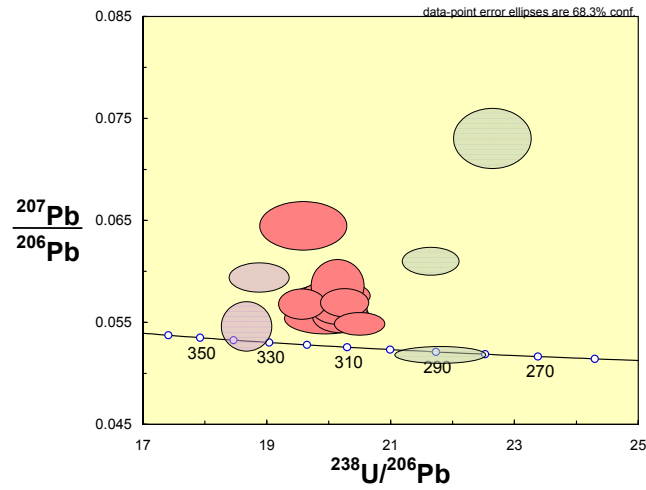
Table 5. Summary of SHRIMP U-Pb zircon analytical data for sample RSC218A
Torsdale Volcanics: rhyolitic ignimbrite. Cockatoo Creek near Taroom-Auburn road, BUNGABAN, MGA 234400 7153600

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	101	72	0.71	3.8	0.002048	2.66	22.641	0.413	0.0730	0.0019	0.0430	0.0008	271.4	5.0
1.2	210	226	1.08	9.2	0.001616	1.46	19.581	0.466	0.0644	0.0016	0.0503	0.0012	316.5	7.5
2.1	432	285	0.66	17.1	0.000604	1.11	21.642	0.303	0.0610	0.0009	0.0457	0.0007	288.0	4.0
2.2	349	201	0.58	15.9	0.000940	0.79	18.865	0.319	0.0594	0.0010	0.0526	0.0009	330.4	5.5
3.1	287	295	1.03	12.2	0.001348	0.75	20.137	0.281	0.0586	0.0017	0.0493	0.0007	310.2	4.3
4.1	957	923	0.96	37.7	0.000010	<0.01	21.794	0.483	0.0518	0.0005	0.0459	0.0010	289.3	6.3
5.1	365	191	0.52	15.5	0.000661	0.54	20.250	0.257	0.0569	0.0009	0.0491	0.0006	309.1	3.9
6.1	304	191	0.63	12.9	0.000408	0.45	20.169	0.291	0.0562	0.0009	0.0494	0.0007	310.6	4.4
7.1	264	112	0.42	11.2	-	0.37	20.189	0.301	0.0556	0.0010	0.0493	0.0007	310.5	4.6
8.1	229	91	0.40	10.6	0.000265	0.18	18.664	0.268	0.0546	0.0016	0.0535	0.0008	335.9	4.8
9.1	304	174	0.57	13.1	0.000272	0.34	19.936	0.434	0.0554	0.0010	0.0500	0.0011	314.5	6.7
10.1	328	198	0.60	14.0	0.000236	0.62	20.097	0.372	0.0576	0.0010	0.0494	0.0009	311.1	5.7
11.1	522	823	1.58	21.9	0.000115	0.29	20.491	0.268	0.0548	0.0007	0.0487	0.0006	306.3	4.0
12.1	319	185	0.58	14.0	0.000500	0.50	19.561	0.251	0.0568	0.0010	0.0509	0.0007	319.9	4.1
12.2	291	162	0.56	12.5	0.000520	0.56	19.983	0.416	0.0572	0.0010	0.0498	0.0010	313.1	6.4

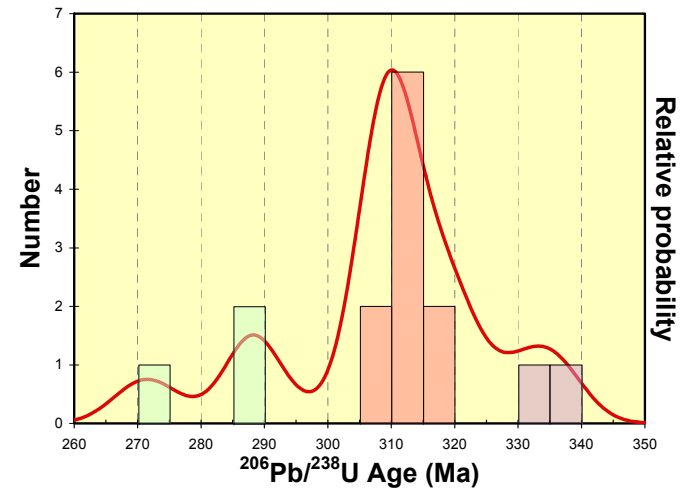
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.77% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age ± no std ± include std
311.6 3.0 3.8

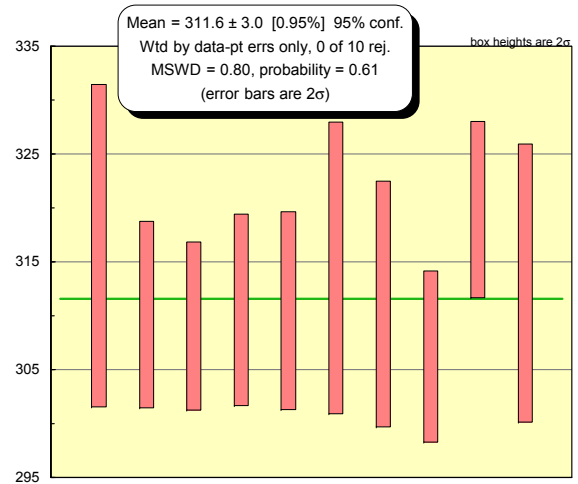
Figure 5. Plots of SHRIMP U-Pb zircon data for sample RSC218A



(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains

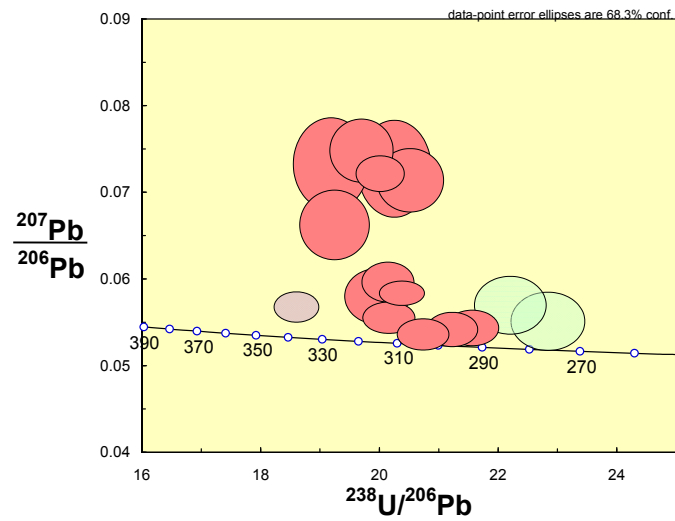
Table 6. Summary of SHRIMP U-Pb zircon analytical data for sample BB2535
 Camboon Volcanics: ignimbrite, Delusion Creek, CRACOW, MGA 227131 7215636

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	153	111	0.73	6.6	0.001530	2.44	19.988	0.273	0.0721	0.0014	0.0488	0.0007	307.2	4.3
2.1	132	76	0.58	5.5	0.000899	0.11	20.720	0.288	0.0533	0.0012	0.0482	0.0007	303.5	4.2
3.1	150	151	1.00	6.9	0.000493	0.41	18.570	0.249	0.0565	0.0012	0.0536	0.0007	336.8	4.5
4.1	238	120	0.50	10.0	0.000691	0.70	20.355	0.252	0.0581	0.0009	0.0488	0.0006	307.1	3.8
5.1	142	79	0.55	6.0	-	0.33	20.138	0.293	0.0553	0.0012	0.0495	0.0007	311.4	4.5
6.1	103	49	0.47	4.4	0.001379	2.52	20.229	0.412	0.0727	0.0037	0.0482	0.0010	303.4	6.3
7.1	265	126	0.48	10.5	0.000031	0.24	21.547	0.298	0.0541	0.0014	0.0463	0.0006	291.8	4.0
8.1	105	57	0.54	4.6	0.002740	2.76	19.676	0.353	0.0748	0.0024	0.0494	0.0009	310.9	5.7
9.1	89	39	0.44	4.0	0.003207	1.65	19.213	0.390	0.0661	0.0027	0.0512	0.0011	321.8	6.5
10.1	117	75	0.64	5.0	0.001323	0.64	19.934	0.357	0.0578	0.0021	0.0498	0.0009	313.6	5.6
11.1	77	36	0.46	3.5	0.001980	2.54	19.153	0.423	0.0732	0.0036	0.0509	0.0012	320.0	7.2
12.1	90	45	0.50	3.8	0.002286	2.36	20.498	0.374	0.0713	0.0024	0.0476	0.0009	300.0	5.5
13.1	96	43	0.45	3.7	0.001253	0.60	22.191	0.400	0.0567	0.0022	0.0448	0.0008	282.5	5.1
14.1	170	123	0.72	7.3	0.001531	0.85	20.119	0.293	0.0594	0.0015	0.0493	0.0007	310.1	4.5
15.1	113	62	0.55	4.3	0.000902	0.38	22.824	0.409	0.0549	0.0022	0.0436	0.0008	275.4	4.9
17.1	205	88	0.43	8.3	-	0.20	21.210	0.286	0.0539	0.0013	0.0471	0.0006	296.4	4.0

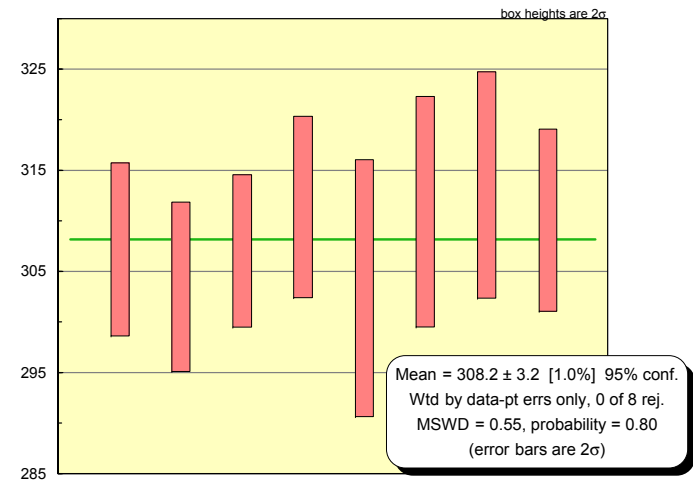
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.75% & 0.97% for the two analytical sessions. (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
	308.2	3.2	5.0
from unmix	309.1	3.3	5.0

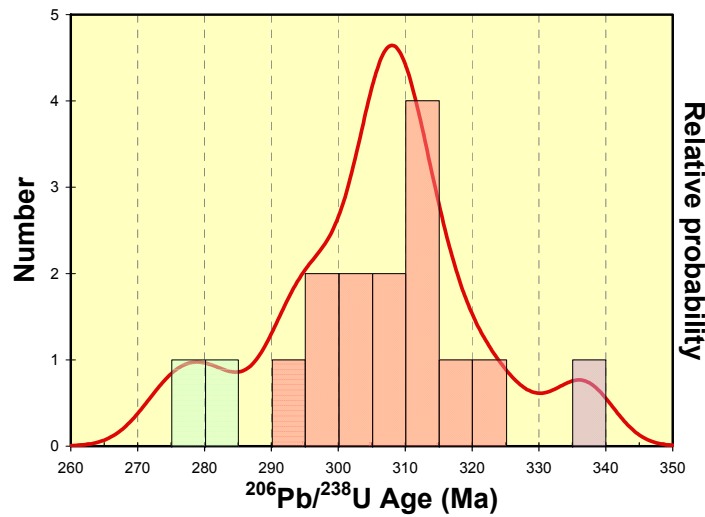
Figure 6. Plots of SHRIMP U-Pb zircon data for sample BB2535



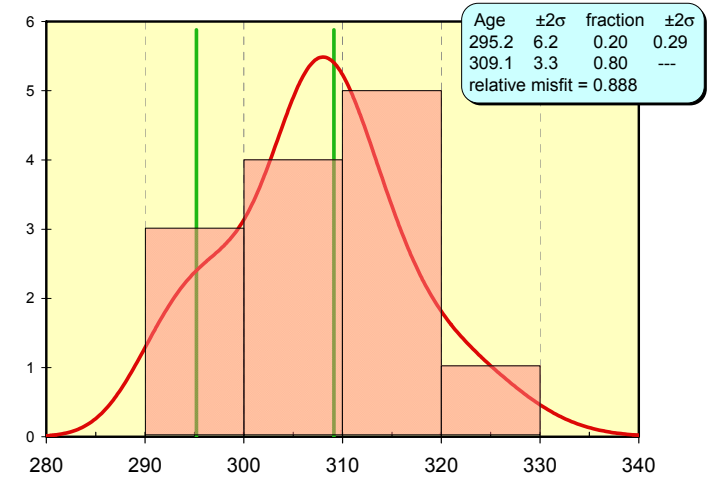
(a) Tera-Wasserburg plot, all analyses



(b) Weighted average – best estimate



(c) Probability density plot – all grains



(d) Probability density plot – unmixed

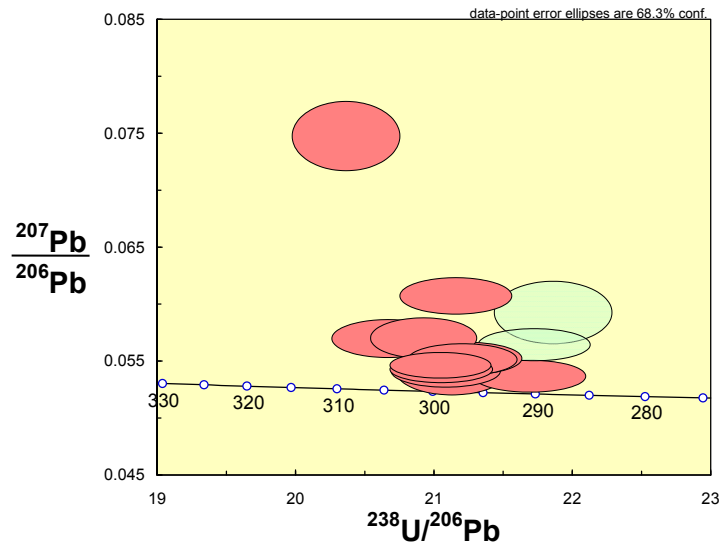
Table 7. Summary of SHRIMP U-Pb zircon analytical data for sample IWGG809
 Camboon Volcanics: crystal-rich rhyolitic ignimbrite. 11km north of Rannes, BANANA, MGA 206680 7342697

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	684	315	0.46	27.9	0.000210	0.29	21.042	0.243	0.0546	0.0007	0.0474	0.0006	298.4	3.4
2.1	421	191	0.45	17.2	0.000562	0.23	21.082	0.260	0.0542	0.0009	0.0473	0.0006	298.1	3.6
3.1	428	168	0.39	16.9	0.000041	0.20	21.692	0.268	0.0537	0.0009	0.0460	0.0006	290.0	3.5
4.1	387	171	0.44	15.7	0.000214	0.24	21.127	0.268	0.0542	0.0014	0.0472	0.0006	297.4	3.7
5.1	557	352	0.63	24.6	0.004826	9.04	19.496	0.234	0.1248	0.0014	0.0467	0.0008	294.0	5.0
6.1	385	233	0.61	16.2	0.001336	2.79	20.360	0.255	0.0747	0.0020	0.0477	0.0006	300.7	3.9
7.1	461	189	0.41	18.9	0.000194	0.58	20.925	0.254	0.0570	0.0012	0.0475	0.0006	299.2	3.6
8.1	349	208	0.60	14.2	0.000125	1.06	21.157	0.267	0.0607	0.0011	0.0468	0.0006	294.6	3.7
9.1	410	234	0.57	16.1	0.000051	0.90	21.860	0.280	0.0593	0.0018	0.0453	0.0006	285.8	3.7
10.1	858	692	0.81	35.8	0.003481	6.56	20.594	0.244	0.1046	0.0062	0.0454	0.0008	286.1	4.8
11.1	416	208	0.50	16.8	-	0.37	21.234	0.261	0.0552	0.0009	0.0469	0.0006	295.6	3.6
12.1	572	320	0.56	23.4	0.000249	0.25	21.052	0.245	0.0543	0.0008	0.0474	0.0006	298.4	3.4
13.1	380	197	0.52	15.4	0.000064	0.36	21.206	0.260	0.0551	0.0009	0.0470	0.0006	296.0	3.6
14.1	387	249	0.64	15.3	0.000282	0.54	21.723	0.265	0.0564	0.0009	0.0458	0.0006	288.6	3.5
15.1	278	134	0.48	11.6	0.000547	0.57	20.665	0.268	0.0570	0.0011	0.0481	0.0006	302.9	3.9

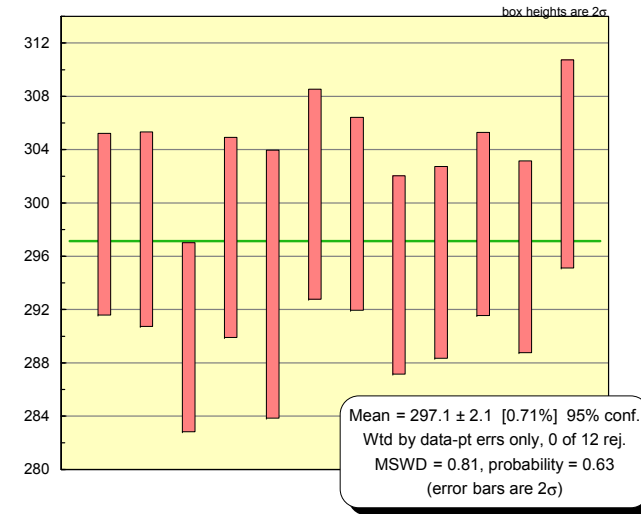
- Notes:
1. Uncertainties given at the one s level.
 2. Error in AS3 reference zircon calibration was 0.85% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera and Wasserburg (1972) as outlined in Williams (1998).

Age **± no std** **± include std**
297.1 **2.1** **3.3**

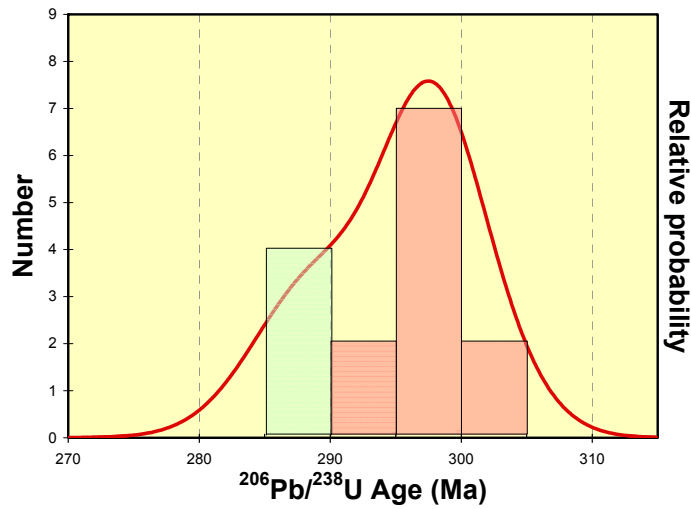
Figure 7. Plots of SHRIMP U-Pb zircon data for sample IWGG809



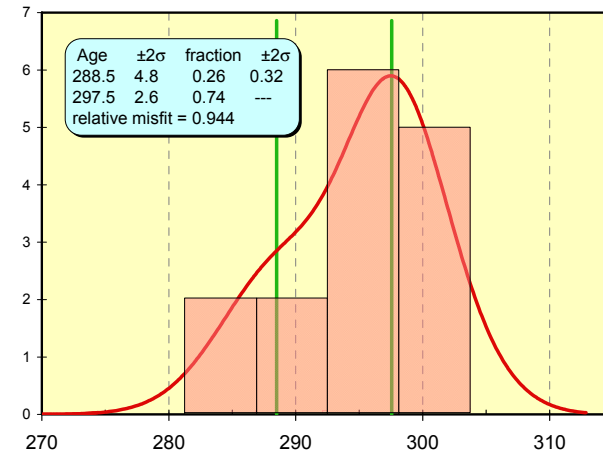
(a) Tera-Wasserburg plot, lower common Pb



(b) Weighted average – best estimate -



(c) Probability density plot – all grains



(d) Probability density plot – unmixed

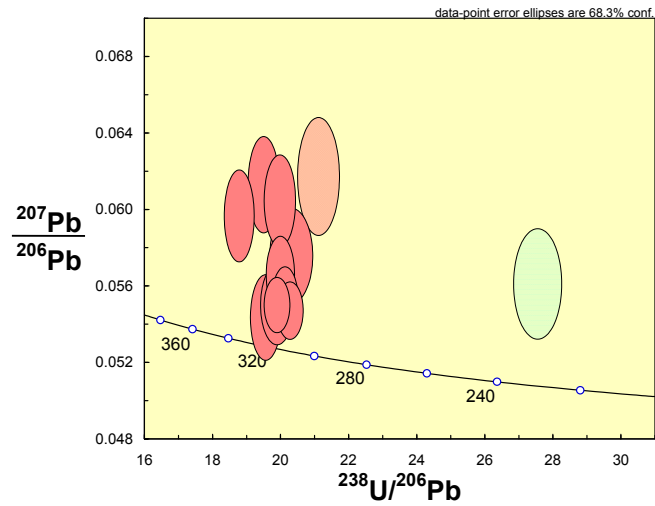
Table 8. Summary of SHRIMP U-Pb zircon analytical data for sample LHT540
 Boam Creek Granodiorite: biotite hornblende granodiorite. Road to Kandoona, south-east of Mount Appenben, THEODORE, MGA 228115 7239385

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	114	98	0.86	4.8	0.000648	0.62	20.222	0.427	0.0575	0.0017	0.0491	0.0011	309.3	6.5
2.1	310	319	1.03	13.2	0.000078	0.26	20.183	0.264	0.0547	0.0010	0.0494	0.0007	311.0	4.0
3.1	152	88	0.57	6.6	0.000739	0.28	19.796	0.318	0.0549	0.0014	0.0504	0.0008	316.8	5.0
4.1	220	401	1.82	6.9	0.000172	0.67	27.535	0.466	0.0561	0.0019	0.0361	0.0006	228.5	3.9
5.1	147	144	0.98	6.5	-	0.18	19.471	0.294	0.0543	0.0015	0.0513	0.0008	322.3	4.8
6.1	131	106	0.81	6.0	-	0.81	18.690	0.290	0.0596	0.0016	0.0531	0.0008	333.3	5.1
7.1	118	108	0.92	5.2	0.000432	1.05	19.408	0.307	0.0613	0.0017	0.0510	0.0008	320.6	5.1
8.1	138	132	0.95	6.0	0.001263	0.97	19.886	0.305	0.0604	0.0016	0.0498	0.0008	313.3	4.8
9.1	95	88	0.92	3.9	0.000032	1.18	21.026	0.402	0.0617	0.0020	0.0470	0.0009	296.1	5.6
10.1	311	332	1.07	13.5	0.000602	0.28	19.810	0.248	0.0550	0.0010	0.0503	0.0006	316.6	3.9
11.1	249	267	1.07	10.7	0.000330	0.32	20.030	0.264	0.0552	0.0011	0.0498	0.0007	313.1	4.1
12.1	187	165	0.88	8.1	-	0.48	19.897	0.282	0.0565	0.0013	0.0500	0.0007	314.6	4.4

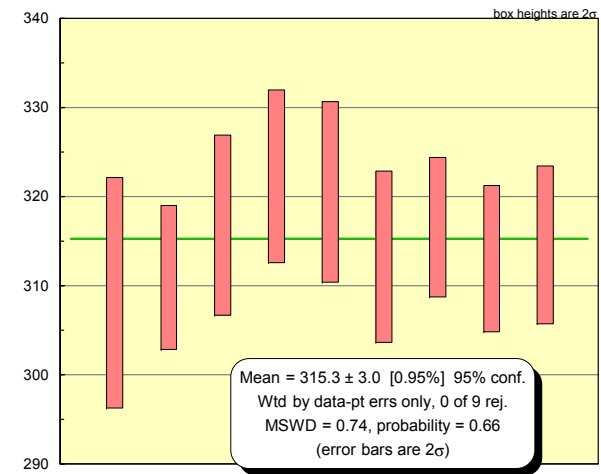
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.85% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age ± no std ± include std
 315.3 3.0 4.0

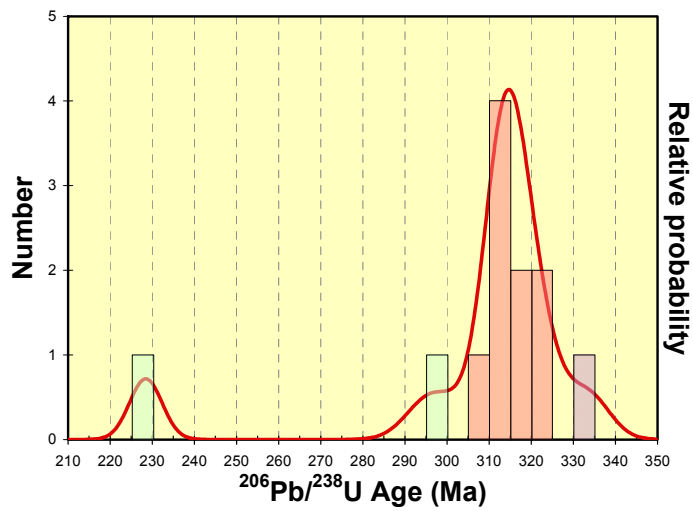
Figure 8. Plots of SHRIMP U-Pb zircon data for sample LHT540



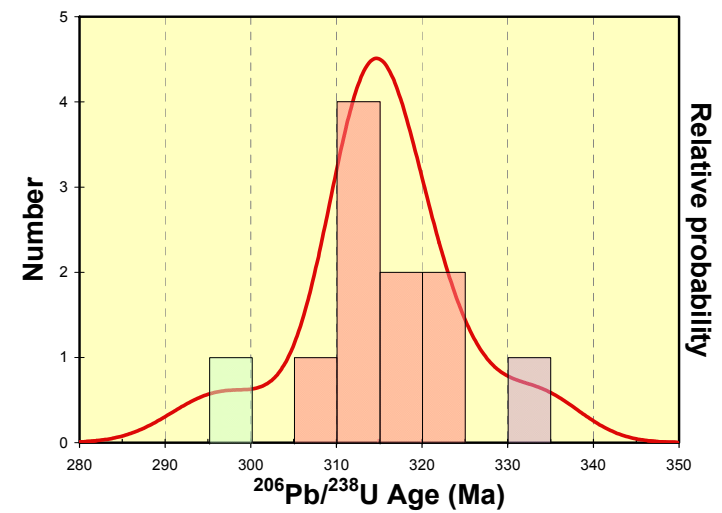
(a) Tera-Wasserburg plot, all analyses



(b) Weighted average – dominant group -



(c) Probability density plot – all grains



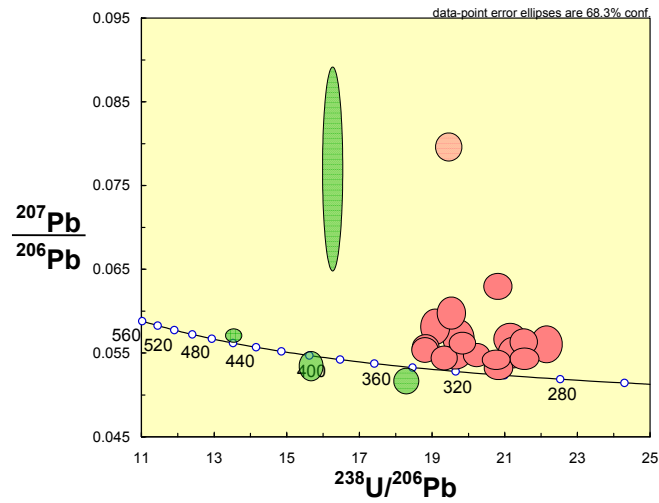
(d) Probability density plot – magmatic grains

Table 9. Summary of SHRIMP U-Pb zircon analytical data for sample QFG2722
 Coonambula Granodiorite: Deformed (gneissic) biotite granite. Target Creek, 9km west of Coonambula, AUBURN, MGA 284469 7177150

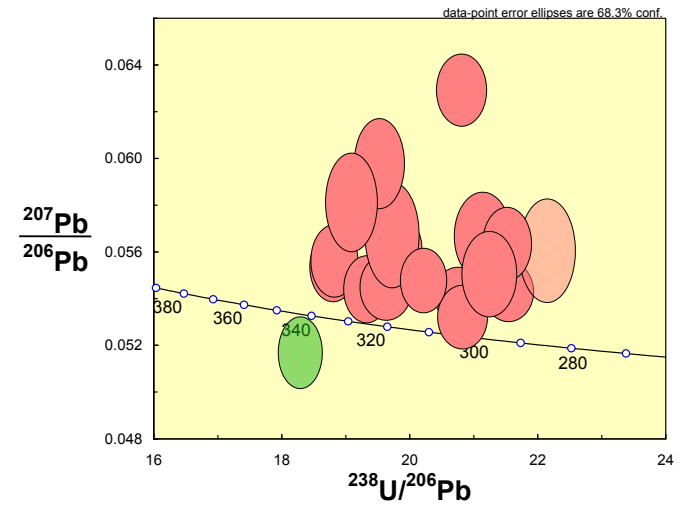
Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	333	69	0.21	17.6	0.002006	2.83	16.245	0.189	0.0769	0.0080	0.0598	0.0010	374.5	5.9
2.1	381	430	1.13	15.8	0.000495	0.22	20.750	0.251	0.0542	0.0008	0.0481	0.0006	302.8	3.6
3.1	281	122	0.43	11.6	0.000262	0.10	20.823	0.258	0.0532	0.0009	0.0480	0.0006	302.1	3.7
4.1	268	74	0.27	11.1	0.000942	1.32	20.802	0.260	0.0629	0.0010	0.0474	0.0006	298.8	3.7
5.1	158	35	0.22	6.4	0.000721	0.55	21.136	0.294	0.0567	0.0012	0.0471	0.0007	296.4	4.1
6.1	245	210	0.86	11.2	0.000561	0.28	18.795	0.240	0.0554	0.0010	0.0531	0.0007	333.3	4.2
7.1	198	106	0.54	9.0	0.000787	0.31	18.811	0.243	0.0556	0.0010	0.0530	0.0007	332.9	4.2
8.1	315	208	0.66	13.6	0.000307	0.43	19.822	0.239	0.0562	0.0009	0.0502	0.0006	315.9	3.8
9.1	526	95	0.18	33.4	0.000039	0.11	13.522	0.148	0.0571	0.0005	0.0739	0.0008	459.4	4.9
10.1	117	36	0.31	6.4	0.000012	<0.01	15.652	0.219	0.0534	0.0012	0.0640	0.0009	399.9	5.5
11.1	255	174	0.68	11.3	0.000335	0.18	19.317	0.240	0.0544	0.0009	0.0517	0.0007	324.8	4.0
12.1	257	112	0.43	12.1	0.000645	<0.01	18.276	0.227	0.0517	0.0010	0.0548	0.0007	344.1	4.2
13.1	295	74	0.25	11.8	-	0.27	21.535	0.259	0.0543	0.0008	0.0463	0.0006	291.8	3.5
14.1	220	140	0.64	9.7	-	0.21	19.623	0.271	0.0545	0.0009	0.0509	0.0007	319.8	4.4
15.1	279	78	0.28	12.3	0.002397	3.35	19.446	0.238	0.0796	0.0011	0.0497	0.0007	312.7	4.0
16.1	282	125	0.44	11.0	-	0.51	22.146	0.289	0.0560	0.0015	0.0449	0.0006	283.3	3.7
17.1	168	86	0.51	7.3	0.000093	0.50	19.717	0.281	0.0567	0.0015	0.0505	0.0007	317.4	4.5
18.1	219	96	0.44	9.6	0.001178	0.87	19.520	0.259	0.0598	0.0013	0.0508	0.0007	319.3	4.2
19.1	178	118	0.66	8.0	0.001244	0.64	19.081	0.265	0.0581	0.0014	0.0521	0.0007	327.2	4.5
20.1	453	419	0.93	19.3	-	0.27	20.207	0.239	0.0548	0.0009	0.0494	0.0006	310.5	3.6
20.2	877	38	0.04	35.0	0.000223	0.52	21.513	0.254	0.0563	0.0010	0.0462	0.0006	291.4	3.4
21.1	265	43	0.16	10.7	0.001035	0.35	21.238	0.279	0.0550	0.0012	0.0469	0.0006	295.6	3.9

- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.75% & 0.97% for the two analytical sessions. (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

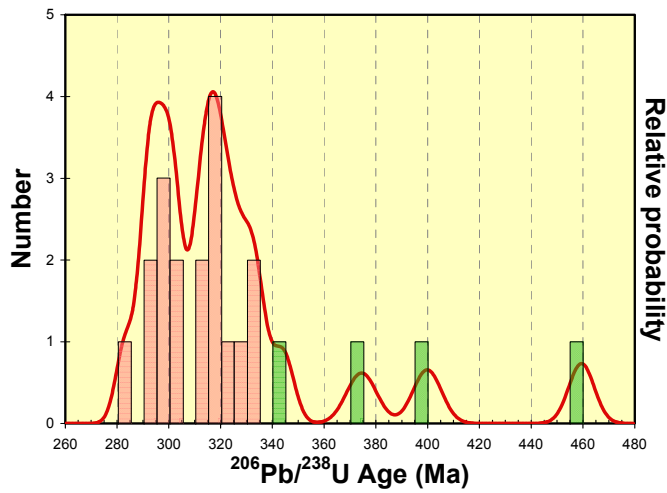
Figure 9. Plots of SHRIMP U-Pb zircon data for sample QFG2722



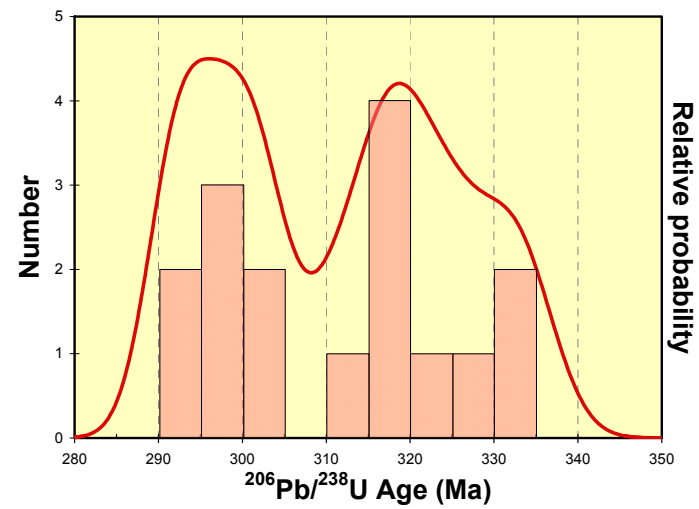
(a) Tera-Wasserburg plot, all analyses



(b) Weighted average – low common Pb



(c) Probability density plot – all grains



(d) Probability density plot – younger groups

Table 10. Summary of SHRIMP U-Pb zircon analytical data for sample RSC164A.

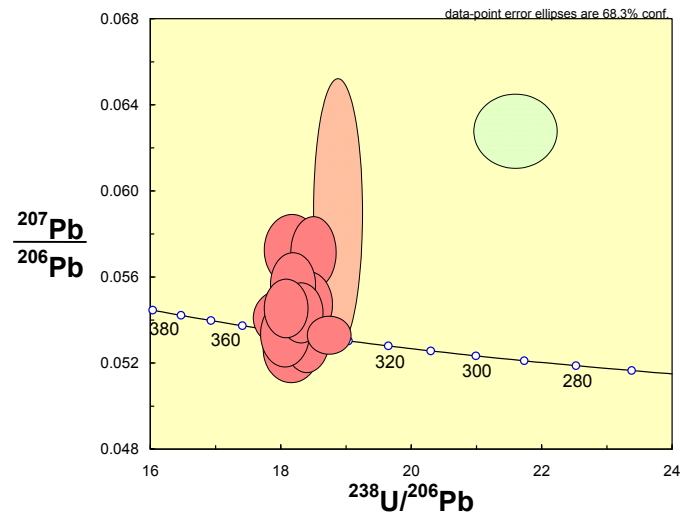
Donore Granite Gneiss: deformed (gneissic) granite. Eidsvold-Cracow road near St Johns Creek crossing, RAWBELLE, MGA 276831 7188285

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	897	413	0.46	100.0	0.016096	57.07	7.702	0.101	0.5144	0.0016	0.0557	0.0093	349.6	56.8
2.1	411	217	0.53	19.5	-	0.14	18.075	0.218	0.0545	0.0009	0.0552	0.0007	346.7	4.1
3.1	483	268	0.55	23.0	-	0.08	18.026	0.305	0.0541	0.0009	0.0554	0.0009	347.8	5.8
4.1	372	162	0.43	17.6	0.000552	0.48	18.165	0.281	0.0573	0.0011	0.0548	0.0009	343.8	5.3
5.1	330	156	0.47	15.4	0.000217	<0.01	18.393	0.240	0.0533	0.0011	0.0544	0.0007	341.3	4.4
6.1	320	150	0.47	15.2	0.000518	<0.01	18.052	0.246	0.0534	0.0010	0.0554	0.0008	347.6	4.7
7.1	450	300	0.67	20.5	0.000656	0.74	18.861	0.248	0.0590	0.0041	0.0526	0.0008	330.6	4.6
8.1	455	235	0.52	21.2	0.000404	0.18	18.423	0.237	0.0547	0.0010	0.0542	0.0007	340.2	4.3
9.1	427	275	0.64	20.1	-	0.12	18.300	0.221	0.0543	0.0009	0.0546	0.0007	342.6	4.1
10.1	478	268	0.56	22.2	0.000188	0.49	18.493	0.228	0.0571	0.0011	0.0538	0.0007	337.9	4.1
11.1	304	132	0.44	14.4	-	<0.01	18.156	0.286	0.0526	0.0010	0.0551	0.0009	345.9	5.4
12.1	900	692	0.77	41.3	0.000035	0.02	18.732	0.224	0.0533	0.0006	0.0534	0.0006	335.2	4.0
13.1	406	206	0.51	19.2	-	0.28	18.181	0.229	0.0557	0.0010	0.0548	0.0007	344.2	4.3
14.1	607	279	0.46	24.1	-	1.33	21.600	0.422	0.0628	0.0011	0.0457	0.0009	287.9	5.6

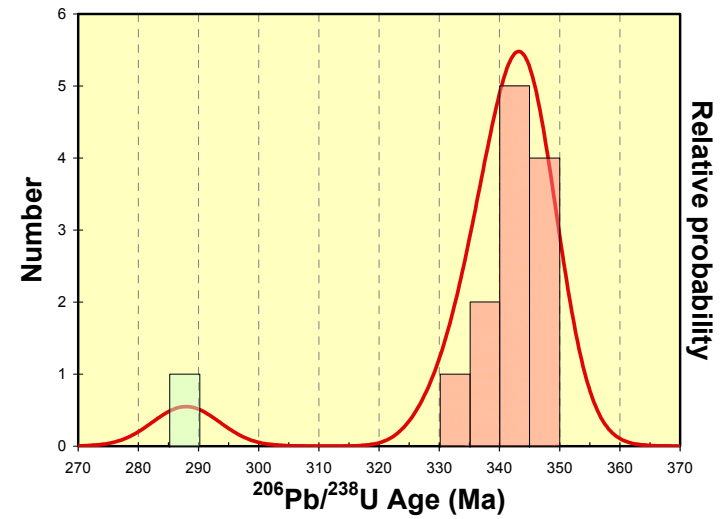
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.86% for the analytical session. (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age
342.5 ± no std ± include std
 2.7 4.0

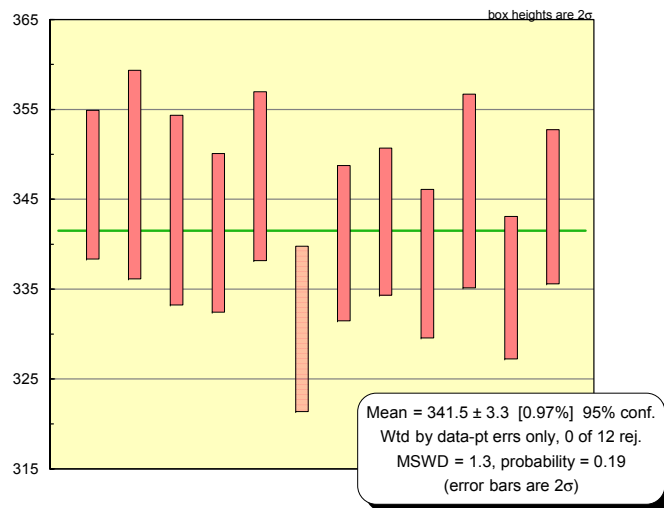
Figure 10. Plots of SHRIMP U-Pb zircon data for sample RSC164A



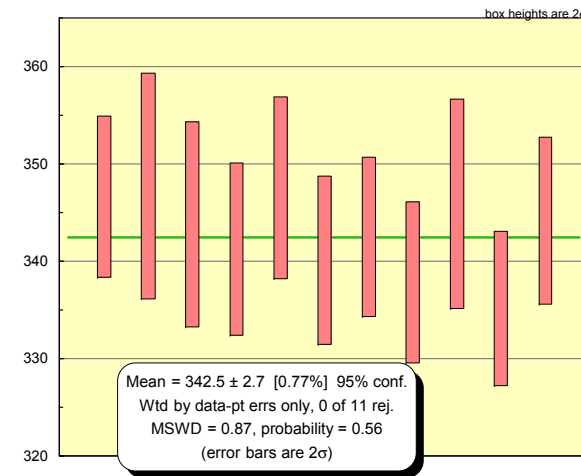
(a) Tera-Wasserburg plot, all analyses except 1.1



(b) Probability density plot – all grains except 1.1



(c) Weighted average – most grains



(d) Weighted average – best estimate

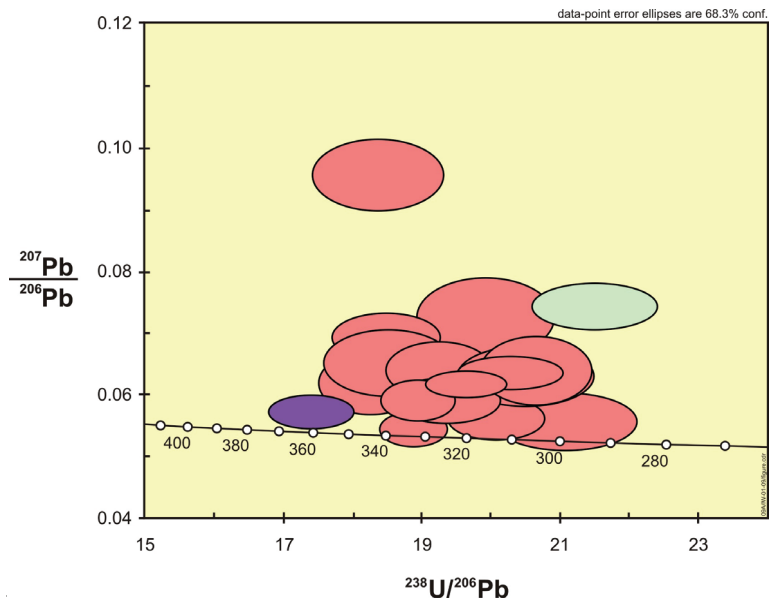
Table 11. Summary of SHRIMP U-Pb zircon analytical data for sample IRAU481
 Evandale Tonalite: hornblende biotite tonalite. South bank of Auburn River north-east of Evandale homestead, AUBURN, MGA 254700 7154700

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Radiogenic		Age (Ma)	
							²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	126	55	0.49	11.0	0.000123	0.02	0.0503	0.0012	316.5	7.6
2.1	51	26	1.22	4.0	0.001152	0.04	0.0513	0.0017	322.3	10.4
3.1	25	15	0.71	2.0	0.001691	0.10	0.0516	0.0022	324.0	13.6
4.1	45	39	1.04	4.0	0.000010	0.01	0.0512	0.0017	322.0	10.4
5.1	37	21	0.69	3.0	0.001424	0.11	0.0530	0.0019	332.8	11.4
6.1	59	54	1.08	5.0	0.002601	0.09	0.0453	0.0016	285.3	9.7
7.1	72	59	0.91	6.0	0.000010	0.02	0.0477	0.0015	300.6	9.5
8.1	81	88	0.69	8.0	0.000428	0.02	0.0487	0.0015	306.3	9.2
9.1	73	42	0.72	7.0	0.003213	0.08	0.0572	0.0017	358.5	10.1
10.1	96	121	0.58	10.0	0.000084	0.01	0.0524	0.0012	329.1	7.5
11.1	41	39	0.70	4.0	0.001975	0.09	0.0473	0.0019	297.7	11.6
12.1	69	74	1.75	7.0	0.000010	0.03	0.0496	0.0014	312.1	8.7
13.1	37	25	0.85	4.0	0.001377	0.06	0.0523	0.0022	334.0	13.7
14.1	59	27	1.04	5.0	0.002257	0.10	0.0542	0.0019	340.0	11.3
15.1	51	50	0.69	5.0	-	0.11	0.0481	0.0019	303.1	11.6
16.1	37	27	0.74	3.0	0.003586	0.13	0.0490	0.0020	308.1	12.4
17.1	103	80	0.98	10.0	-	0.05	0.0529	0.0012	332.1	7.0

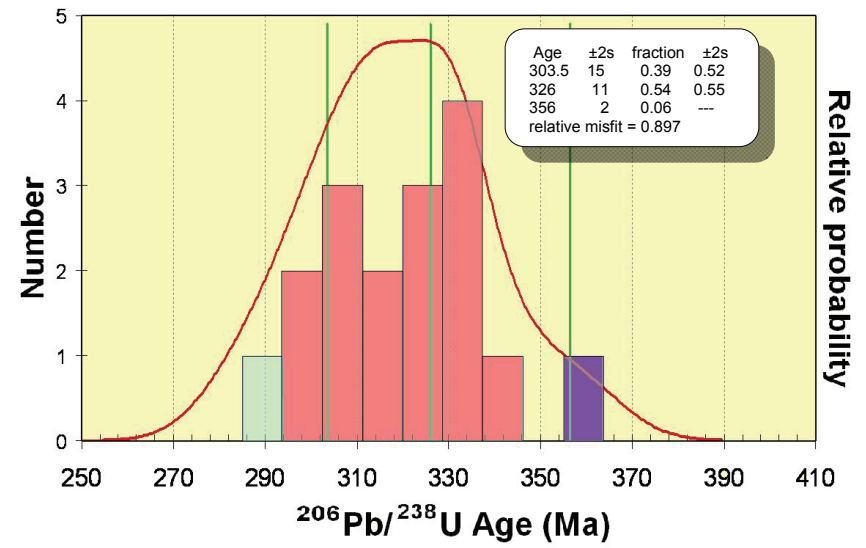
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.68% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera and Wasserburg (1972) as outlined in Williams (1998).

Magmatic age **Age
~305Ma**

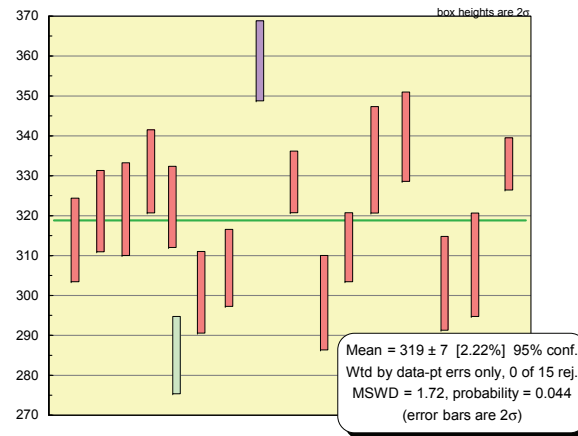
Figure 11. Plots of SHRIMP U-Pb zircon data for sample IRAU419



(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains

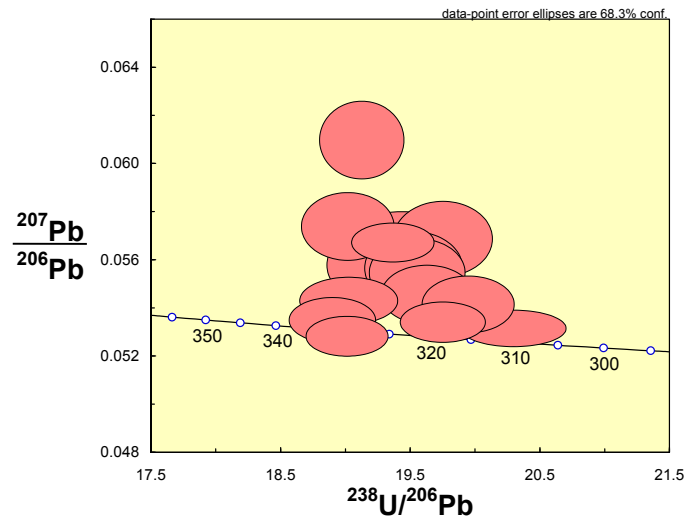
Table 12. Summary of SHRIMP U-Pb zircon analytical data for sample RSC137
 Glandore Granodiorite: hornblende-biotite granodiorite. Near Glandore homestead, THEODORE, MGA 24412 7248110

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	195	114	0.58	8.6	0.000134	0.35	19.520	0.249	0.0557	0.0010	0.0510	0.0007	321.0	4.0
2.1	185	139	0.75	8.0	0.000706	0.52	19.748	0.252	0.0569	0.0010	0.0504	0.0007	316.8	4.0
3.1	603	401	0.67	26.8	0.000200	0.48	19.360	0.210	0.0567	0.0005	0.0514	0.0006	323.1	3.5
4.1	389	394	1.01	17.7	0.000332	0.05	18.895	0.221	0.0535	0.0006	0.0529	0.0006	332.3	3.8
5.1	305	164	0.54	13.1	0.000241	0.18	19.944	0.235	0.0541	0.0008	0.0500	0.0006	314.8	3.7
6.1	552	569	1.03	24.9	0.000204	<0.01	19.008	0.209	0.0528	0.0005	0.0526	0.0006	330.6	3.6
7.1	453	286	0.63	20.5	0.000200	0.16	19.021	0.250	0.0543	0.0006	0.0525	0.0007	329.8	4.3
8.1	199	124	0.62	9.0	0.000662	0.54	19.013	0.236	0.0574	0.0009	0.0523	0.0007	328.7	4.0
9.1	212	169	0.80	9.4	0.000219	0.46	19.431	0.343	0.0565	0.0010	0.0512	0.0009	322.1	5.6
10.1	261	188	0.72	11.4	0.000311	0.22	19.625	0.234	0.0545	0.0008	0.0508	0.0006	319.7	3.8
11.1	207	197	0.95	9.1	0.000648	0.33	19.551	0.244	0.0554	0.0009	0.0510	0.0006	320.5	4.0
12.1	782	739	0.95	33.1	0.000137	0.07	20.292	0.267	0.0531	0.0005	0.0492	0.0007	309.9	4.0
13.1	183	116	0.63	8.2	0.000068	0.35	19.225	0.247	0.0558	0.0010	0.0518	0.0007	325.8	4.1
14.1	471	423	0.90	21.2	0.000402	1.00	19.121	0.215	0.0610	0.0011	0.0518	0.0006	325.4	3.7
15.1	638	691	1.08	27.7	0.000078	0.08	19.748	0.217	0.0534	0.0006	0.0506	0.0006	318.2	3.5

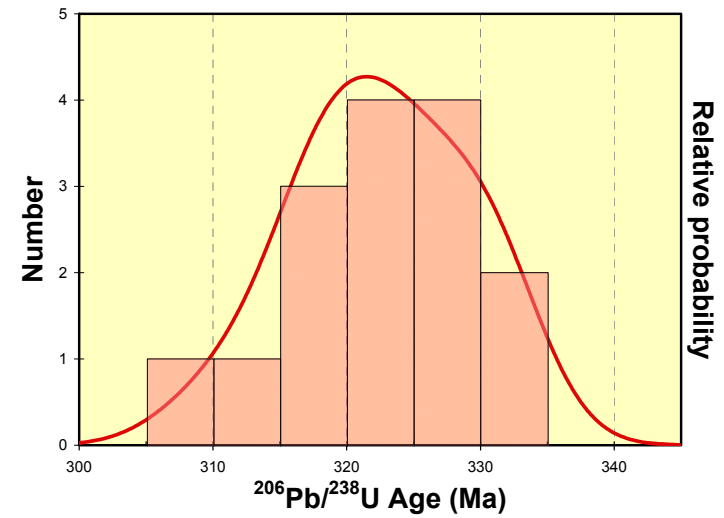
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.79% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	± no std	± include std
323.4	3.0	3.9

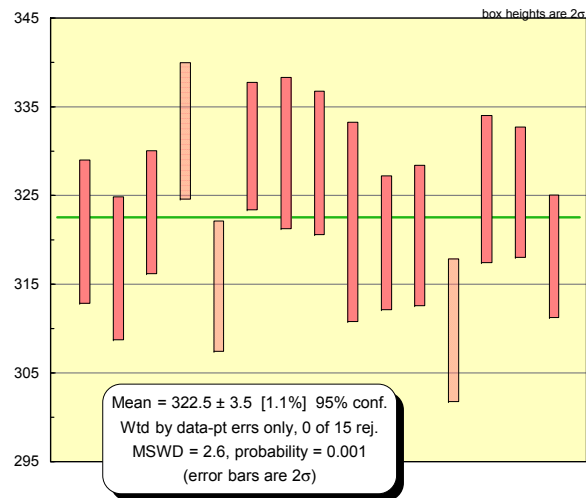
Figure 12. Plots of SHRIMP U-Pb zircon data for sample RSC137



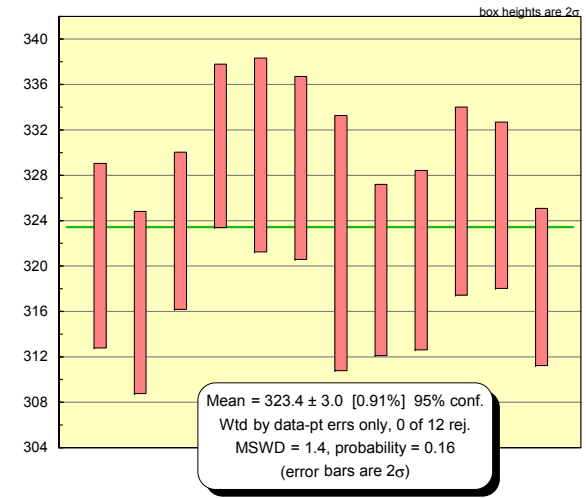
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

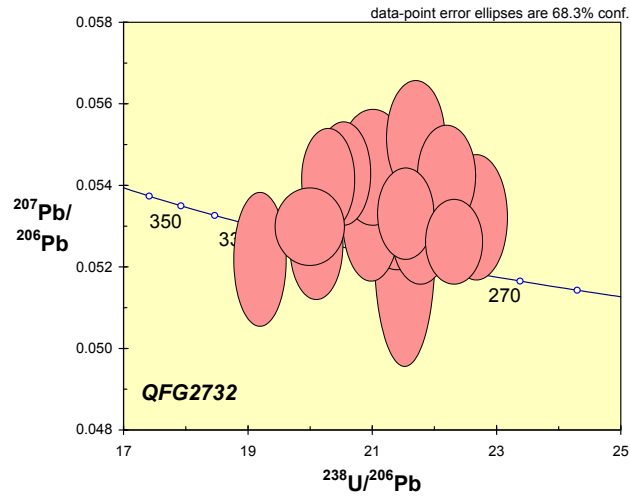
Table 13. Summary of SHRIMP U-Pb zircon analytical data for sample QFG2732
Widbury Granite: biotite granite. South of Widbury homestead, AUBURN, MGA 293936 7183354

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	456	89	0.19	17.7	0.000124	0.29	22.198	0.308	0.0542	0.0008	0.0449	0.0006	283.3	3.9
2.1	356	131	0.37	15.1	0.000171	0.20	20.295	0.283	0.0541	0.0008	0.0492	0.0007	309.5	4.3
3.1	304	121	0.40	13.0	0.000257	<0.01	20.101	0.285	0.0525	0.0009	0.0498	0.0007	313.0	4.4
4.1	250	87	0.35	10.2	0.000443	0.11	20.987	0.305	0.0532	0.0010	0.0476	0.0007	299.8	4.3
5.1	364	177	0.49	14.3	-	0.09	21.777	0.306	0.0528	0.0008	0.0459	0.0007	289.2	4.0
6.1	306	138	0.45	12.3	0.000144	0.18	21.408	0.402	0.0536	0.0011	0.0466	0.0009	293.8	5.5
7.1	347	149	0.43	13.1	0.000256	0.17	22.680	0.329	0.0532	0.0010	0.0440	0.0006	277.7	4.0
8.1	569	480	0.84	24.5	0.000033	0.04	20.000	0.371	0.0530	0.0006	0.0500	0.0009	314.4	5.7
9.1	242	88	0.36	10.8	0.000016	<0.01	19.200	0.279	0.0522	0.0011	0.0521	0.0008	327.6	4.7
10.1	296	133	0.45	12.1	0.000239	0.27	21.017	0.372	0.0544	0.0009	0.0475	0.0008	298.9	5.2
11.1	575	265	0.46	22.1	0.000144	0.09	22.319	0.305	0.0526	0.0007	0.0448	0.0006	282.3	3.8
12.1	484	139	0.29	19.3	0.000060	0.14	21.543	0.297	0.0533	0.0007	0.0464	0.0006	292.1	4.0
13.1	431	244	0.57	18.0	0.000230	0.23	20.544	0.288	0.0543	0.0008	0.0486	0.0007	305.7	4.2
14.1	339	90	0.26	13.4	0.000337	0.39	21.704	0.309	0.0552	0.0009	0.0459	0.0007	289.3	4.1
15.1	213	84	0.40	8.5	0.000373	0.03	21.522	0.326	0.0524	0.0019	0.0464	0.0007	292.7	4.4

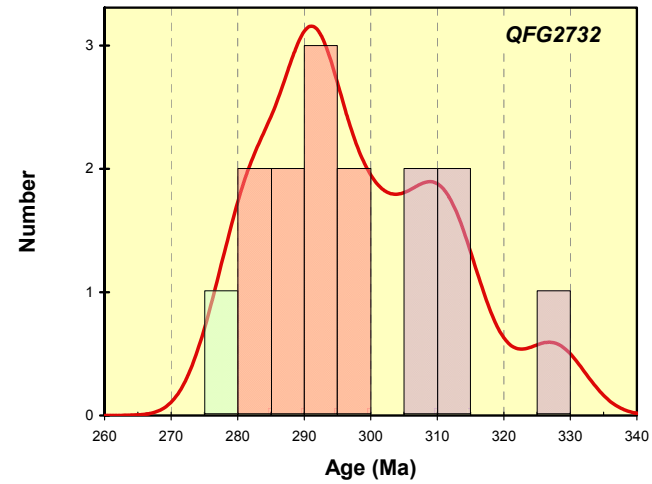
- Notes: 1. Uncertainties given at the one σ level.
2. Error in FC1 Reference zircon calibration was 0.45% for the analytical session (not included in above errors but required when comparing data from different mounts).
3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

estimate **Age** **± no std** **± include std**
 290.4 **4.7** **4.9**

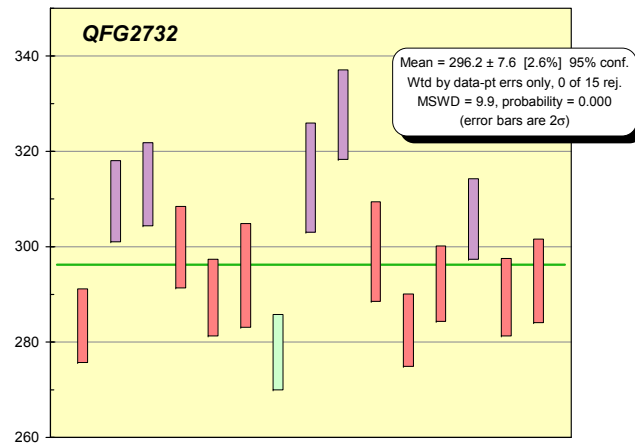
Figure 13. Plots of SHRIMP U-Pb zircon data for sample QFG2732



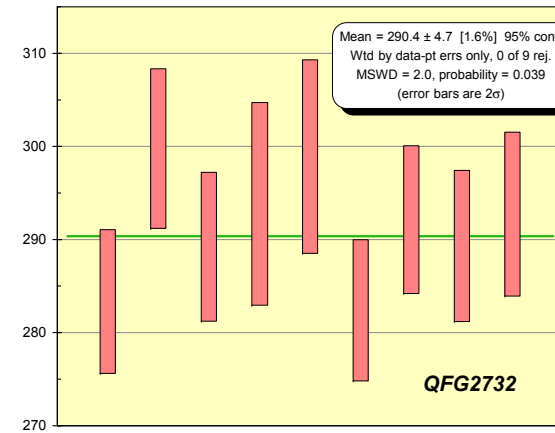
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average best estimate

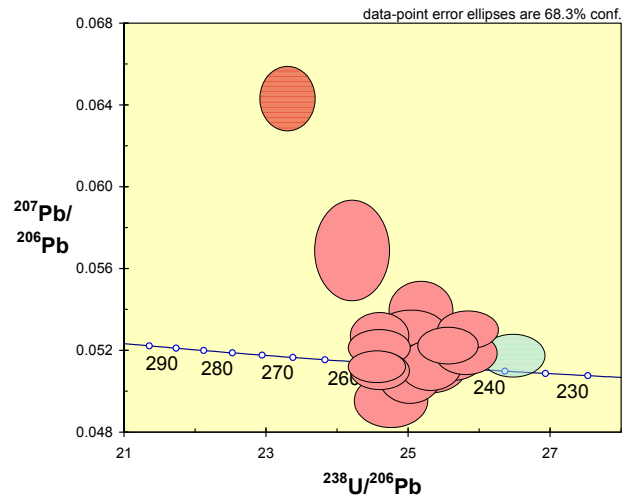
Table 14. Summary of SHRIMP U-Pb zircon analytical data for sample QFG2591
 Wingfield Granite: hornblende-biotite granite. Nogo River, near Old Rawbelle homestead, SCORIA, MGA 282768 7228923

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	732	438	0.60	25.1	0.000102	0.22	25.06	0.31	0.0530	0.0006	0.0398	0.0005	251.7	3.1
2.1	656	399	0.61	21.8	0.000220	0.10	25.83	0.29	0.0518	0.0007	0.0387	0.0004	244.7	2.7
3.1	775	509	0.66	26.5	0.000155	0.02	25.17	0.31	0.0513	0.0006	0.0397	0.0005	251.1	3.1
4.1	383	473	1.23	12.9	0.000071	0.09	25.62	0.33	0.0518	0.0009	0.0390	0.0005	246.6	3.2
5.1	859	632	0.73	30.0	0.000103	0.09	24.60	0.29	0.0521	0.0006	0.0406	0.0005	256.6	3.0
6.1	463	315	0.68	15.9	-	<0.01	25.03	0.33	0.0511	0.0008	0.0400	0.0005	252.5	3.3
7.1	351	393	1.12	12.0	-	0.34	25.19	0.30	0.0540	0.0009	0.0396	0.0005	250.2	2.9
8.1	640	405	0.63	21.3	-	0.14	25.75	0.29	0.0522	0.0007	0.0388	0.0004	245.2	2.7
9.1	785	578	0.74	27.4	0.000037	<0.01	24.61	0.28	0.0510	0.0006	0.0407	0.0005	256.9	2.9
10.1	730	449	0.62	24.8	-	0.01	25.33	0.34	0.0512	0.0009	0.0395	0.0005	249.6	3.3
11.1	390	433	1.11	13.5	-	<0.01	24.76	0.34	0.0495	0.0009	0.0405	0.0006	255.8	3.5
12.1	699	530	0.76	22.7	0.000173	0.10	26.49	0.30	0.0517	0.0007	0.0377	0.0004	238.6	2.7
13.1	690	461	0.67	24.1	-	0.17	24.60	0.27	0.0527	0.0008	0.0406	0.0005	256.4	2.8
14.1	128	142	1.11	4.6	0.000301	0.68	24.22	0.35	0.0569	0.0016	0.0410	0.0006	259.1	3.7
15.1	1072	738	0.69	37.5	-	<0.01	24.56	0.27	0.0512	0.0005	0.0407	0.0004	257.3	2.8
16.1	837	554	0.66	27.8	0.000069	0.24	25.86	0.28	0.0530	0.0006	0.0386	0.0004	244.1	2.7
17.1	824	837	1.02	30.4	0.001035	1.59	23.30	0.26	0.0643	0.0010	0.0422	0.0005	266.6	3.0
18.1	362	484	1.34	12.4	-	<0.01	25.03	0.30	0.0508	0.0009	0.0400	0.0005	252.7	3.0
19.1	842	626	0.74	28.3	0.000134	0.14	25.57	0.28	0.0522	0.0006	0.0391	0.0004	246.9	2.7
20.1	443	257	0.58	15.0	0.000078	0.01	25.33	0.29	0.0512	0.0008	0.0395	0.0005	249.6	2.9

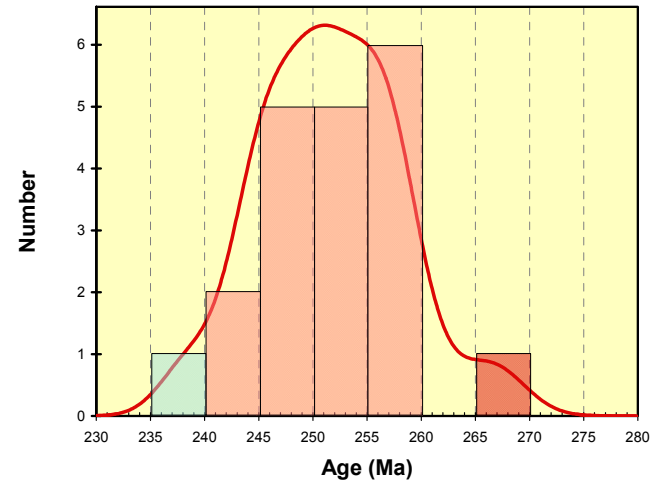
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 0.33% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998)

Age ± no std ± include std
 251.1 2.4 3.6

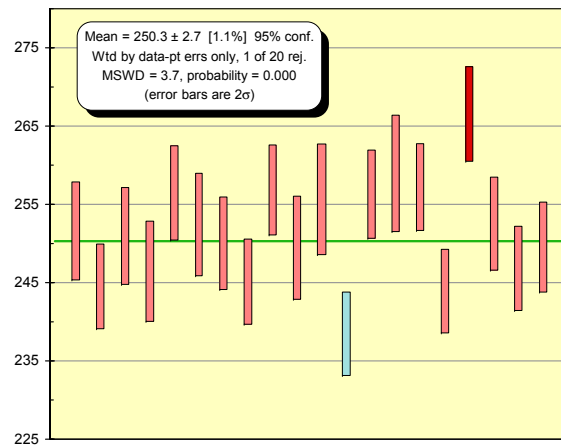
Figure 14. Plots of SHRIMP U-Pb zircon data for sample QFG2591



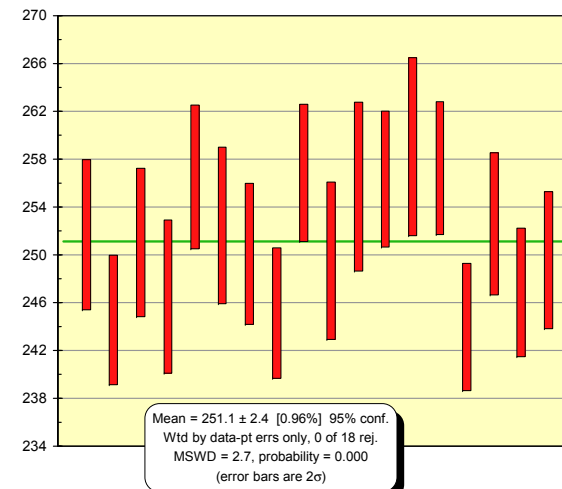
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – most grains

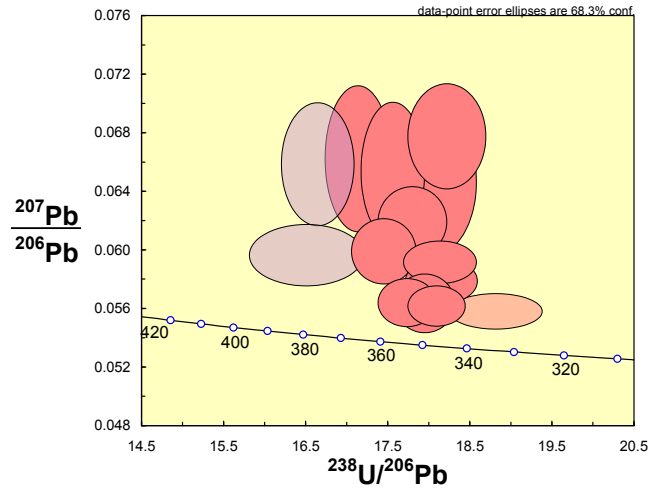
Table 15. Summary of SHRIMP U-Pb zircon analytical data for sample RSC093;
 Clive Creek Volcanics: crystal-rich, lithic-poor rhyolitic ignimbrite. Old Bruce Highway near Mount Mackenzie, MOUNT BLUFFKIN, MGA 749770 7470770

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	386	231	0.60	17.6	0.000310	0.33	18.810	0.374	0.0558	0.0008	0.0530	0.0011	332.8	6.5
2.1	217	125	0.58	10.5	0.000160	0.35	17.727	0.234	0.0564	0.0011	0.0562	0.0008	352.6	4.6
3.1	306	261	0.85	14.5	-	0.34	18.087	0.230	0.0561	0.0009	0.0551	0.0007	345.8	4.3
4.1	157	93	0.59	8.1	0.002354	1.47	16.634	0.294	0.0658	0.0028	0.0592	0.0011	371.0	6.6
5.1	276	171	0.62	13.0	-	0.56	18.144	0.289	0.0578	0.0010	0.0548	0.0009	344.0	5.4
6.1	143	60	0.42	7.5	0.000297	0.68	16.497	0.459	0.0596	0.0014	0.0602	0.0017	376.9	10.3
7.1	113	84	0.75	5.4	0.000893	1.40	18.015	0.368	0.0646	0.0034	0.0547	0.0012	343.5	7.1
8.1	151	84	0.56	7.4	0.001323	1.46	17.555	0.257	0.0653	0.0031	0.0561	0.0009	352.1	5.3
9.1	141	64	0.45	6.9	0.000920	0.77	17.442	0.257	0.0599	0.0015	0.0569	0.0009	356.7	5.2
10.1	283	208	0.73	13.4	0.000373	0.72	18.129	0.292	0.0591	0.0010	0.0548	0.0009	343.7	5.5
11.1	206	150	0.73	9.8	0.000140	0.36	17.942	0.241	0.0563	0.0013	0.0555	0.0008	348.4	4.6
12.1	127	82	0.65	6.0	0.001025	1.80	18.211	0.314	0.0677	0.0024	0.0539	0.0010	338.6	5.9
13.1	109	44	0.40	5.4	0.001161	1.54	17.129	0.265	0.0662	0.0033	0.0575	0.0009	360.3	5.7
14.1	158	73	0.47	7.6	0.001858	1.04	17.791	0.277	0.0619	0.0016	0.0556	0.0009	348.9	5.4

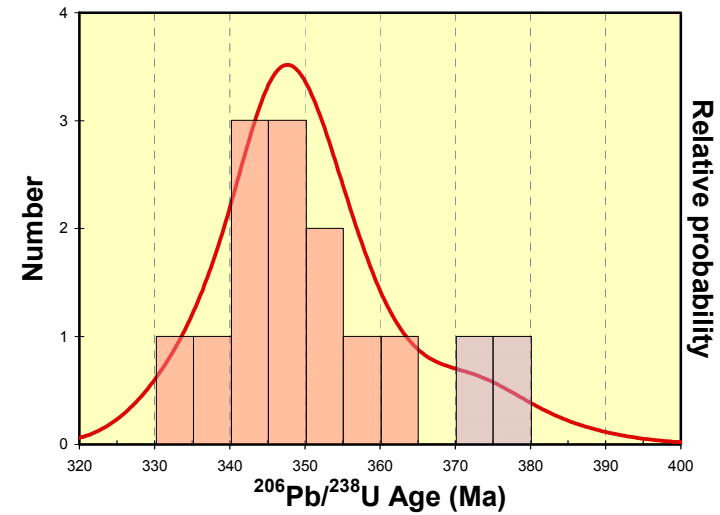
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.77% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	± no std	± include std
348.9	4.0	4.8

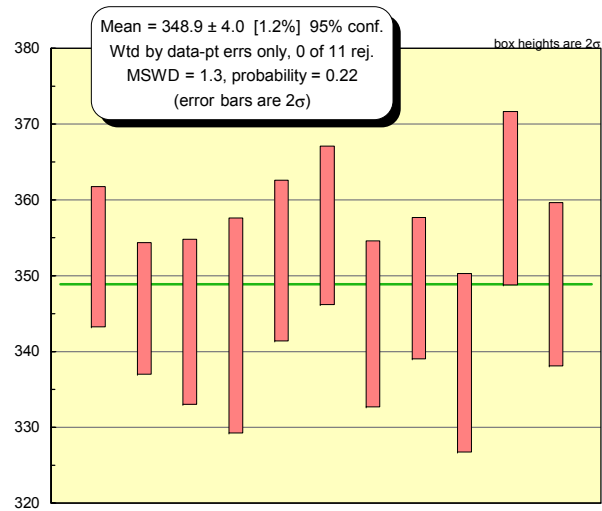
Figure 15. Plots of SHRIMP U-Pb zircon data for sample RSC093



(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains

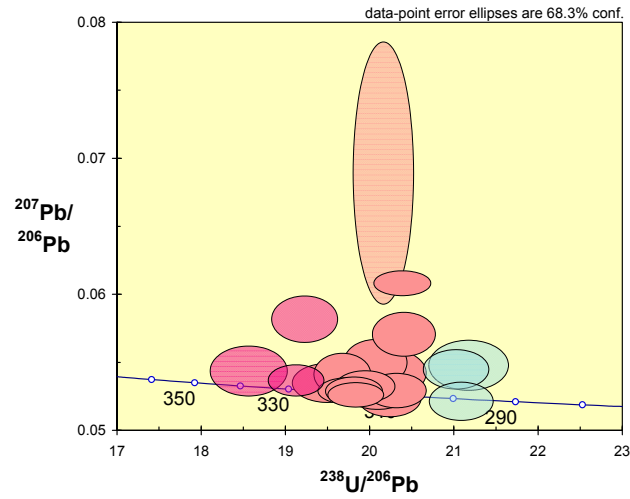
Table 16. Summary of SHRIMP U-Pb zircon analytical data for sample IWSC0323
 Broadsound Range Volcanics: crystal-rich rhyolite ignimbrite. East of Mount Mackenzie, MOUNT BLUFFKIN, MGA 754791 7468649

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	284	183	0.64	11.5	0.000079	0.31	21.17	0.31	0.0547	0.0012	0.0471	0.0007	296.6	4.3
2.1	425	270	0.63	18.3	0.000386	0.07	19.95	0.23	0.0532	0.0008	0.0501	0.0006	315.2	3.7
3.1	458	511	1.12	19.5	0.000249	2.05	20.16	0.24	0.0689	0.0064	0.0486	0.0007	305.9	4.4
4.1	173	84	0.48	7.4	0.000070	0.20	20.19	0.32	0.0542	0.0012	0.0494	0.0008	311.1	4.9
5.1	408	275	0.67	17.5	0.000232	0.01	20.09	0.25	0.0527	0.0008	0.0498	0.0006	313.1	3.8
6.1	327	226	0.69	15.1	0.000197	0.14	18.56	0.30	0.0543	0.0012	0.0538	0.0009	337.9	5.4
7.1	358	210	0.59	15.2	0.000157	0.04	20.32	0.24	0.0529	0.0008	0.0492	0.0006	309.6	3.6
8.1	425	291	0.68	18.6	0.000089	0.16	19.67	0.22	0.0541	0.0010	0.0508	0.0006	319.1	3.6
9.1	389	264	0.68	17.5	-	0.08	19.12	0.22	0.0537	0.0008	0.0522	0.0006	328.3	3.7
10.1	233	125	0.54	9.8	0.000372	0.57	20.40	0.25	0.0571	0.0011	0.0487	0.0006	306.7	3.7
11.1	633	648	1.02	27.4	0.000017	<0.01	19.83	0.22	0.0526	0.0006	0.0504	0.0006	317.2	3.5
12.1	222	135	0.61	9.9	0.000558	0.65	19.22	0.26	0.0582	0.0011	0.0517	0.0007	324.9	4.4
13.1	293	184	0.63	12.5	0.000114	<0.01	20.24	0.25	0.0523	0.0009	0.0494	0.0006	311.0	3.8
14.1	268	163	0.61	10.9	0.000094	0.27	21.02	0.26	0.0545	0.0010	0.0474	0.0006	298.8	3.6
15.1	207	117	0.57	8.9	0.000648	0.29	20.06	0.25	0.0550	0.0011	0.0497	0.0006	312.7	3.9
16.1	495	575	1.16	21.5	-	0.01	19.81	0.22	0.0528	0.0007	0.0505	0.0006	317.4	3.5
17.1	288	154	0.54	11.7	0.000362	<0.01	21.09	0.25	0.0521	0.0009	0.0474	0.0006	298.7	3.5
18.1	714	789	1.11	30.1	0.000816	1.04	20.39	0.22	0.0608	0.0006	0.0485	0.0005	305.6	3.3
19.1	240	249	1.04	10.6	0.000264	0.07	19.49	0.27	0.0534	0.0009	0.0513	0.0007	322.3	4.5
20.1	523	521	1.00	22.8	-	0.01	19.74	0.24	0.0529	0.0006	0.0507	0.0006	318.5	3.8

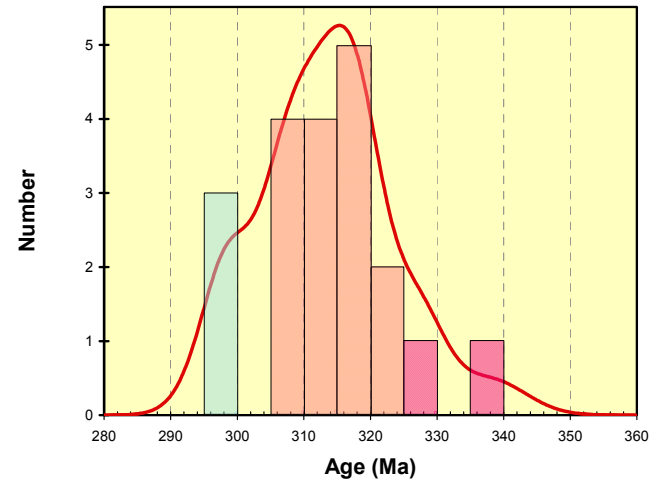
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 0.33% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	± no std	± include std
313.8	3.2	3.4

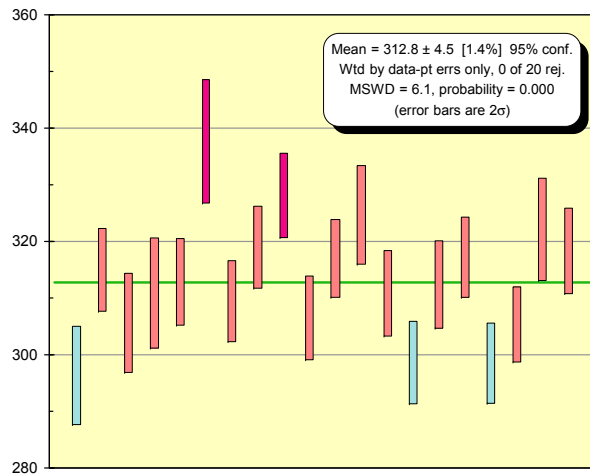
Figure 16. Plots of SHRIMP U-Pb zircon data for sample IWSC0323



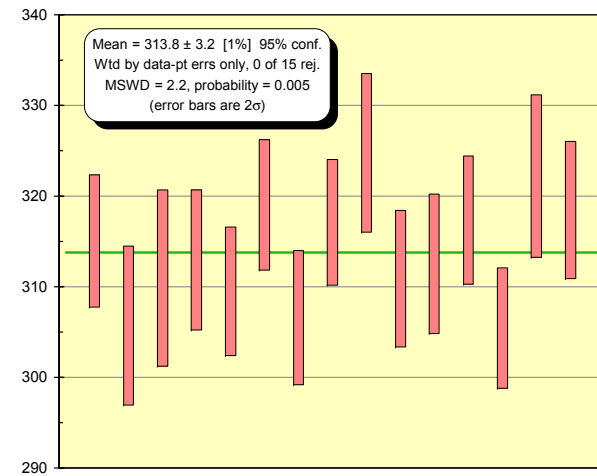
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

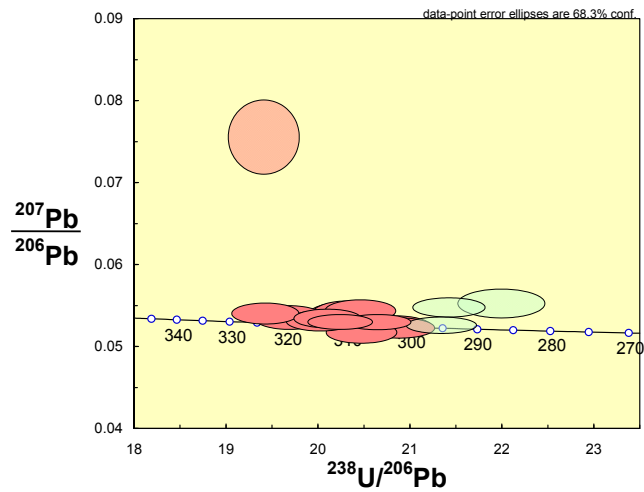
Table 17. Summary of SHRIMP U-Pb zircon analytical data for sample IWSC0669
 Broadsound Range Volcanics: slightly hornfelsed crystal-rich ignimbrite (intruded by Bora Creek Quartz Monzodiorite).
 South of Mount Larry, MOUNT BLUFFKIN, MGA 751535 7482339

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	378	226	0.60	15.9	0.000268	<0.01	20.466	0.254	0.0517	0.0009	0.0489	0.0006	307.8	3.8
2.1	293	131	0.45	12.8	-	0.09	19.681	0.253	0.0535	0.0010	0.0508	0.0007	319.2	4.1
3.1	280	146	0.52	11.8	-	0.04	20.415	0.266	0.0529	0.0010	0.0490	0.0006	308.2	4.0
4.1	375	214	0.57	15.7	0.000068	0.23	20.455	0.255	0.0543	0.0009	0.0488	0.0006	307.0	3.8
5.1	408	212	0.52	17.5	-	0.06	20.015	0.245	0.0531	0.0008	0.0499	0.0006	314.1	3.8
5.2	749	383	0.51	31.2	0.000022	0.06	20.640	0.239	0.0530	0.0006	0.0484	0.0006	304.8	3.5
6.1	656	331	0.50	26.4	-	0.04	21.335	0.252	0.0526	0.0007	0.0469	0.0006	295.2	3.4
7.1	243	97	0.40	10.3	-	0.15	20.287	0.270	0.0538	0.0011	0.0492	0.0007	309.7	4.1
8.1	369	297	0.81	15.6	0.000162	0.15	20.306	0.255	0.0538	0.0012	0.0492	0.0006	309.4	3.9
9.1	358	209	0.58	14.8	0.000016	<0.01	20.839	0.260	0.0524	0.0009	0.0480	0.0006	302.2	3.7
10.1	311	167	0.54	12.1	0.000223	0.40	21.993	0.314	0.0552	0.0012	0.0453	0.0007	285.5	4.0
11.1	494	278	0.56	21.1	0.000019	0.10	20.097	0.242	0.0534	0.0007	0.0497	0.0006	312.7	3.7
12.1	432	217	0.50	17.8	-	<0.01	20.872	0.257	0.0523	0.0008	0.0479	0.0006	301.7	3.7
13.1	334	194	0.58	14.0	0.000076	0.15	20.422	0.266	0.0537	0.0009	0.0489	0.0006	307.7	4.0
14.1	492	327	0.66	19.7	0.000180	0.32	21.419	0.258	0.0548	0.0008	0.0465	0.0006	293.2	3.5
15.1	282	157	0.56	12.5	0.001777	2.84	19.402	0.255	0.0755	0.0030	0.0501	0.0007	315.0	4.4
16.1	801	494	0.62	34.0	0.000061	0.05	20.237	0.233	0.0530	0.0006	0.0494	0.0006	310.8	3.5
17.1	360	226	0.63	15.9	-	0.14	19.421	0.241	0.0540	0.0008	0.0514	0.0006	323.2	4.0

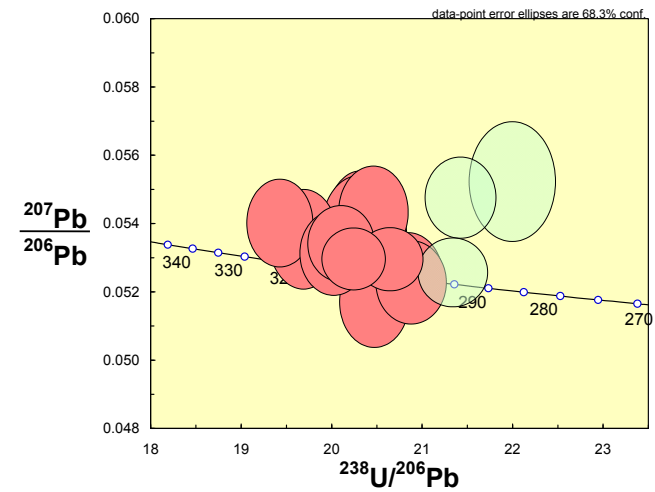
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.82% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
dominant	308.4	2.1	3.3

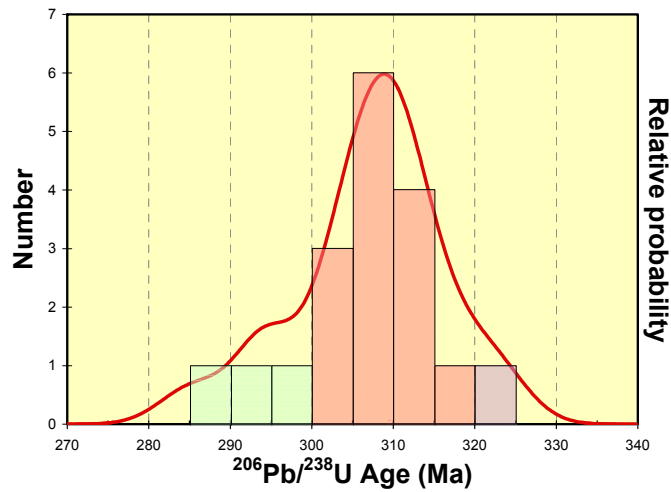
Figure 17. Plots of SHRIMP U-Pb zircon data for sample IWSC0669



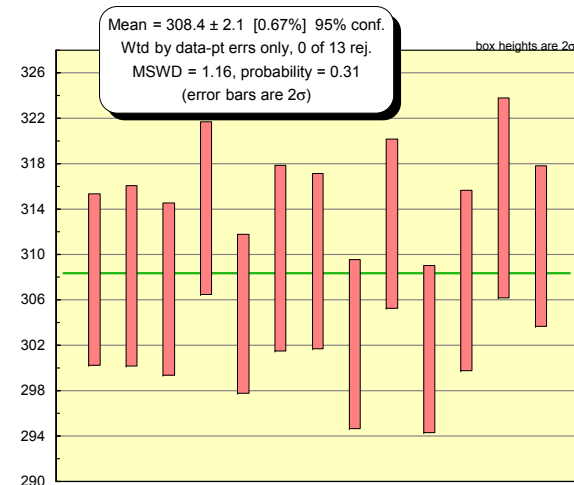
(a) Tera-Wasserburg plot, all analyses



(b) Tera-Wasserburg plot, low common Pb



(c) Probability density plot – all grains



(d) Weighted average – best estimate

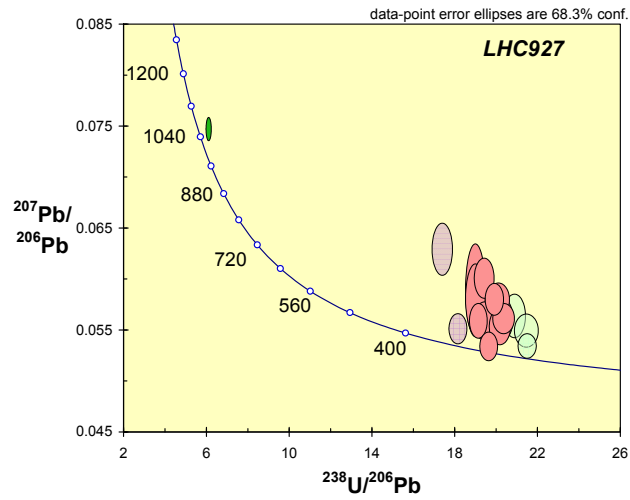
Table 18. Summary of SHRIMP U-Pb zircon analytical data for sample LHC927
 Whelan Creek Volcanics: crystal-rich rhyolite ignimbrite. East of Dacey–Killarney road, south of Dacey, CONNORS RANGE, MGA 734147 7540576

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	343	256	0.75	14.8	0.000207	0.68	19.894	0.296	0.0581	0.0010	0.0499	0.0008	314.1	4.6
2.1	342	200	0.58	15.0	0.000145	0.08	19.611	0.290	0.0535	0.0009	0.0509	0.0008	320.3	4.7
3.1	160	101	0.63	7.2	0.000439	0.75	18.991	0.320	0.0590	0.0030	0.0523	0.0009	328.4	5.6
4.1	165	93	0.56	7.4	0.001034	0.64	19.002	0.316	0.0582	0.0023	0.0523	0.0009	328.5	5.5
5.1	261	185	0.71	36.9	0.000180	0.37	6.093	0.090	0.0748	0.0007	0.1635	0.0025	976.2	13.9
6.1	192	151	0.79	8.5	0.000540	0.92	19.416	0.323	0.0602	0.0013	0.0510	0.0009	320.9	5.3
7.1	287	167	0.58	12.3	0.000224	0.68	20.110	0.356	0.0581	0.0011	0.0494	0.0009	310.7	5.4
8.1	210	139	0.66	8.9	-	0.36	20.170	0.329	0.0554	0.0012	0.0494	0.0008	310.8	5.0
9.1	314	232	0.74	14.9	0.000151	0.23	18.134	0.271	0.0552	0.0010	0.0550	0.0008	345.3	5.1
10.1	281	256	0.91	11.8	0.000322	0.46	20.344	0.356	0.0562	0.0010	0.0489	0.0009	307.9	5.3
11.1	266	196	0.74	10.6	-	0.36	21.449	0.374	0.0551	0.0011	0.0465	0.0008	292.7	5.0
12.1	153	87	0.57	6.5	0.000740	0.45	20.343	0.314	0.0562	0.0013	0.0489	0.0008	308.0	4.7
13.1	208	136	0.65	9.3	0.000193	0.38	19.137	0.283	0.0560	0.0011	0.0521	0.0008	327.1	4.8
14.1	161	90	0.56	7.1	0.000313	0.39	19.452	0.369	0.0560	0.0012	0.0512	0.0010	321.9	6.0
15.1	143	83	0.58	5.9	0.000246	0.52	20.886	0.334	0.0565	0.0014	0.0476	0.0008	300.0	4.8
16.1	459	466	1.02	18.3	0.000146	0.17	21.500	0.298	0.0536	0.0008	0.0464	0.0007	292.6	4.0
17.1	116	50	0.43	5.7	0.000390	1.16	17.381	0.322	0.0630	0.0017	0.0569	0.0011	356.5	6.5

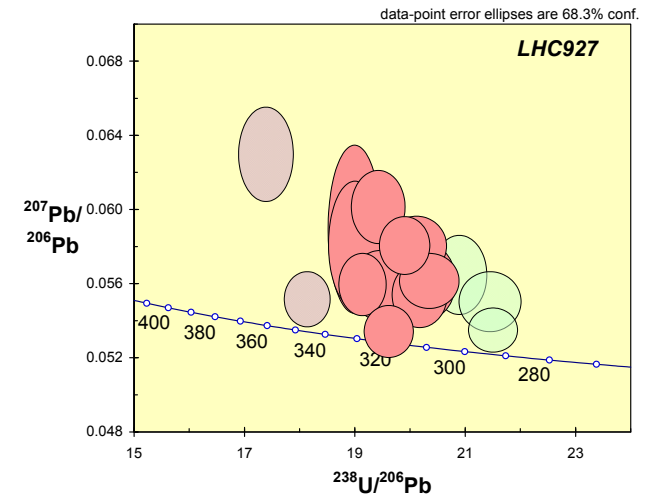
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 0.45% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998)

	Age	± no std	± include std
estimate	317.7	5.4	5.6
another estimate	314.1	4.8	5.0

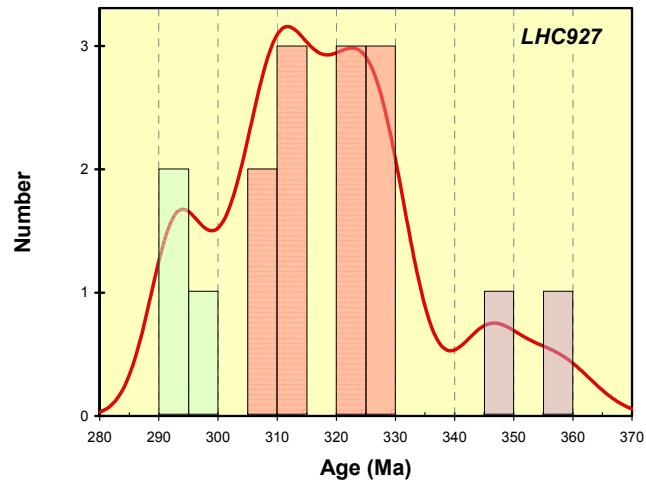
Figure 18. Plots of SHRIMP U-Pb zircon data for sample LHC927



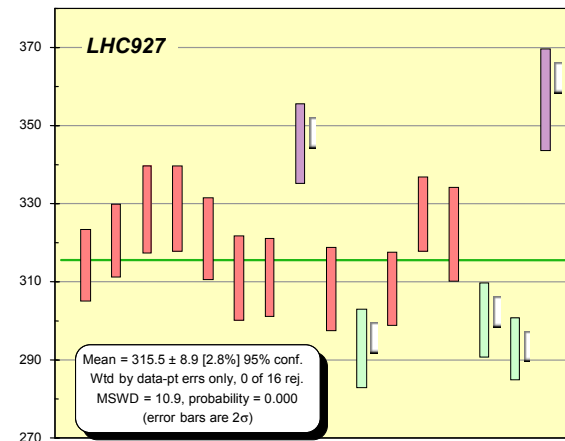
(a) Tera-Wasserburg plot, all analyses



(b) Tera-Wasserburg plot, magmatic grains

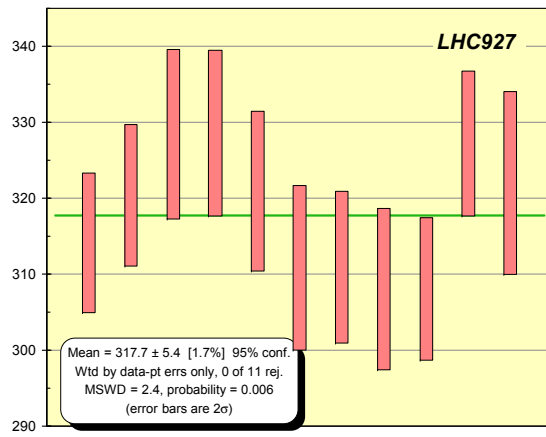


(c) Probability density plot – magmatic grains

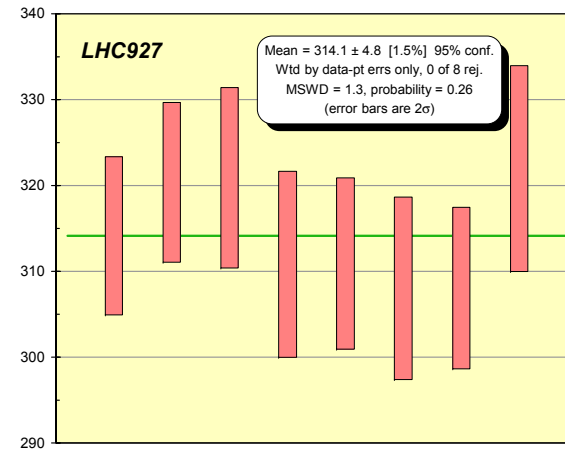


(d) Weighted average – all magmatic grains

Figure 18 (continued). Plots of SHRIMP U-Pb zircon data for sample LHC927



(e) Weighted average – one estimate



(f) Weighted average – younger group

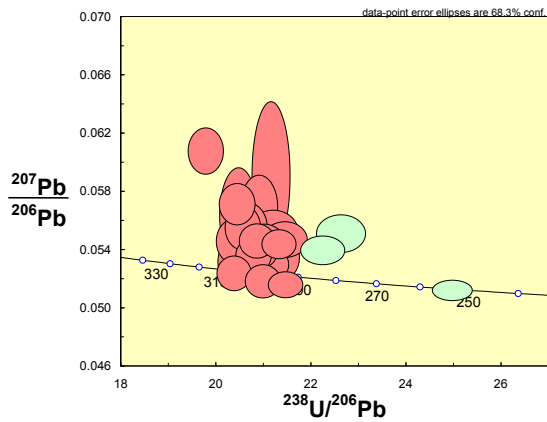
Table 19. Summary of SHRIMP U-Pb zircon analytical data for sample IWSC0353
 Tartus Rhyolite: crystal-rich rhyolitic ignimbrite. Near UHF repeater, east of Mount Mackenzie, MOUNT BLUFFKIN, MGA 755952 7466936

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	481	424	0.88	19.7	0.000377	<0.01	20.974	0.245	0.0518	0.0007	0.0477	0.0006	300.4	3.5
2.1	394	404	1.03	16.2	0.000327	0.20	20.917	0.247	0.0539	0.0008	0.0477	0.0006	300.5	3.5
3.1	344	250	0.73	14.3	0.000443	0.12	20.703	0.304	0.0534	0.0009	0.0482	0.0007	303.7	4.4
4.1	492	625	1.27	20.1	0.000336	0.29	21.006	0.281	0.0546	0.0008	0.0475	0.0006	299.0	3.9
5.1	304	222	0.73	12.3	0.000393	0.37	21.196	0.351	0.0552	0.0010	0.0470	0.0008	296.1	4.9
6.1	367	293	0.80	15.1	0.000393	0.57	20.899	0.253	0.0569	0.0014	0.0476	0.0006	299.6	3.6
7.1	271	162	0.60	10.9	0.000163	0.15	21.352	0.268	0.0534	0.0010	0.0468	0.0006	294.6	3.7
8.1	177	81	0.46	7.4	0.000010	0.08	20.447	0.268	0.0531	0.0012	0.0489	0.0007	307.6	4.0
9.1	246	175	0.71	10.3	0.000090	0.58	20.440	0.249	0.0571	0.0009	0.0486	0.0006	306.2	3.7
10.1	1045	412	0.39	36.0	0.000120	<0.01	24.973	0.272	0.0512	0.0005	0.0400	0.0004	253.1	2.7
11.1	337	248	0.74	13.9	0.000157	0.28	20.858	0.244	0.0546	0.0008	0.0478	0.0006	301.1	3.5
12.1	192	138	0.72	8.0	0.000368	0.38	20.677	0.266	0.0555	0.0011	0.0482	0.0006	303.3	3.9
13.1	221	206	0.93	9.3	-	0.48	20.469	0.262	0.0563	0.0022	0.0486	0.0006	306.1	3.9
14.1	560	682	1.22	21.6	0.000122	0.25	22.241	0.306	0.0539	0.0006	0.0449	0.0006	282.8	3.8
15.1	365	297	0.81	13.9	0.000203	0.41	22.628	0.340	0.0551	0.0009	0.0440	0.0007	277.7	4.1
16.1	523	420	0.80	21.1	0.000052	0.27	21.315	0.240	0.0544	0.0007	0.0468	0.0005	294.8	3.3
17.1	535	564	1.05	21.4	0.000028	<0.01	21.463	0.238	0.0516	0.0006	0.0466	0.0005	293.8	3.2
18.1	194	86	0.44	8.2	0.000710	0.26	20.387	0.252	0.0546	0.0010	0.0489	0.0006	307.9	3.8
19.1	344	210	0.61	14.2	0.000267	0.15	20.782	0.242	0.0536	0.0008	0.0480	0.0006	302.5	3.5
20.1	311	256	0.82	12.4	0.000037	0.31	21.451	0.309	0.0547	0.0008	0.0465	0.0007	292.8	4.2
21.1	314	255	0.81	13.3	0.000181	<0.01	20.374	0.238	0.0524	0.0008	0.0491	0.0006	309.0	3.6
22.1	311	288	0.93	12.6	0.000234	0.09	21.136	0.260	0.0530	0.0008	0.0473	0.0006	297.8	3.6
23.1	276	193	0.70	11.2	-	0.85	21.152	0.259	0.0591	0.0034	0.0469	0.0006	295.3	3.8
24.1	192	84	0.44	7.9	0.000174	0.19	20.711	0.260	0.0539	0.0011	0.0482	0.0006	303.4	3.8
24.2	243	177	0.73	10.5	0.000168	1.01	19.778	0.244	0.0608	0.0010	0.0501	0.0006	314.8	3.9
25.1	303	212	0.70	12.6	0.000247	0.38	20.557	0.245	0.0555	0.0010	0.0485	0.0006	305.1	3.6

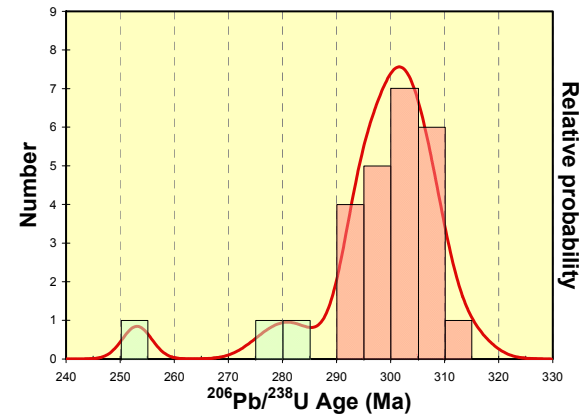
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.64% & 0.84% for the two analytical sessions (not included in above errors - required when comparing data from different mounts).
 3. f_{206} % denotes the percentage of ^{206}Pb that is common Pb.
 4. Correction for common Pb made using the measured $^{238}\text{U}/^{206}\text{Pb}$ and $^{207}\text{Pb}/^{206}\text{Pb}$ ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	\pm no std	\pm include std
300.8	2.2	4.1

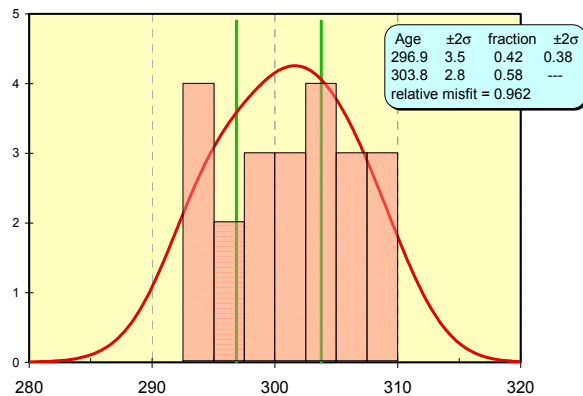
Figure 19. Plots of SHRIMP U-Pb zircon data for sample IWSC0353



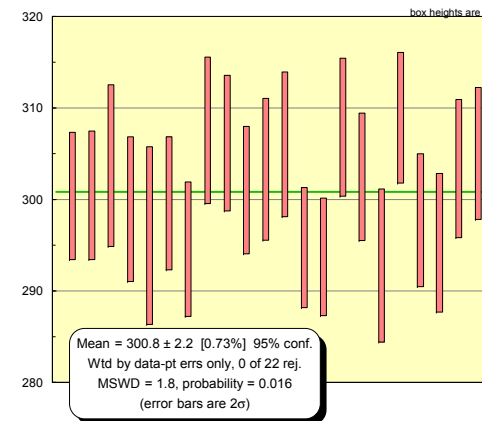
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Probability density plot – main group, unmixed



(d) Weighted average – best estimate

Table 20. Summary of SHRIMP U-Pb zircon analytical data for sample RSC074A

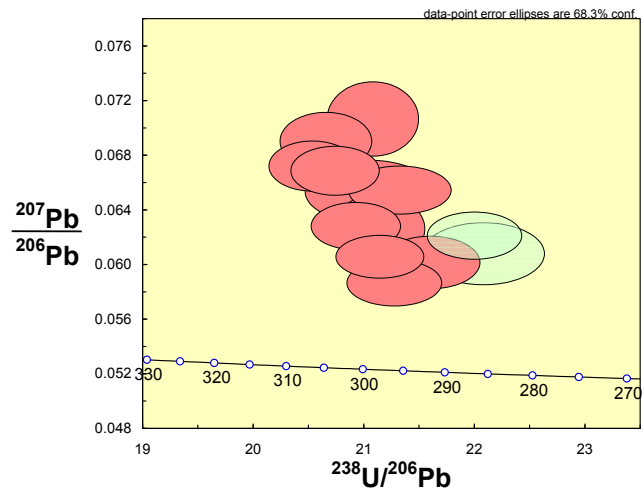
Lotus Creek Rhyolite: crystal-rich, lithic-poor rhyolitic ignimbrite. Big Codling Creek, near Croydon – St Lawrence road, CONNORS RANGE, MGA 732290 7520075

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	315	132	0.42	12.8	0.000292	1.30	21.131	0.277	0.0626	0.0017	0.0467	0.0006	294.3	3.9
2.1	376	207	0.55	15.4	0.000517	1.31	20.928	0.267	0.0628	0.0011	0.0472	0.0006	297.0	3.8
3.1	375	185	0.49	15.1	0.000320	0.80	21.274	0.284	0.0586	0.0011	0.0466	0.0006	293.8	3.9
4.1	412	275	0.67	16.7	0.000413	1.04	21.141	0.265	0.0606	0.0010	0.0468	0.0006	294.9	3.7
5.1	246	100	0.41	9.8	0.000141	1.00	21.600	0.298	0.0601	0.0013	0.0458	0.0006	288.9	4.0
6.1	224	95	0.42	9.1	0.000452	1.64	21.047	0.383	0.0653	0.0015	0.0467	0.0009	294.5	5.3
7.1	388	175	0.45	15.1	0.000379	1.27	22.000	0.281	0.0621	0.0011	0.0449	0.0006	283.0	3.6
8.1	304	221	0.73	12.2	0.000194	1.66	21.323	0.306	0.0655	0.0012	0.0461	0.0007	290.6	4.2
9.1	290	127	0.44	12.0	0.000428	1.81	20.736	0.262	0.0669	0.0012	0.0474	0.0006	298.2	3.8
10.1	272	140	0.51	11.4	0.000532	1.85	20.531	0.260	0.0672	0.0012	0.0478	0.0006	301.0	3.9
11.1	205	76	0.37	8.5	0.000700	2.08	20.652	0.273	0.0690	0.0014	0.0474	0.0006	298.6	4.0
12.1	185	120	0.65	7.2	0.000444	1.10	22.078	0.365	0.0608	0.0015	0.0448	0.0008	282.5	4.7
13.1	207	75	0.37	8.4	-	2.30	21.076	0.275	0.0706	0.0018	0.0464	0.0006	292.1	3.9

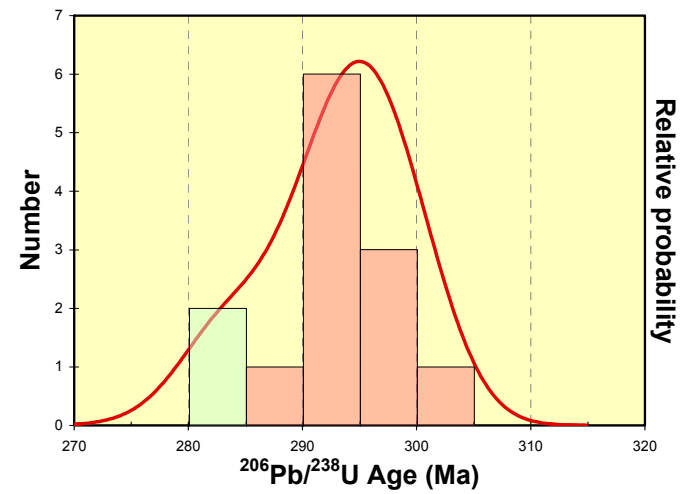
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.86% for the analytical session.
(not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	± no std	± include std
295.0	2.3	3.4

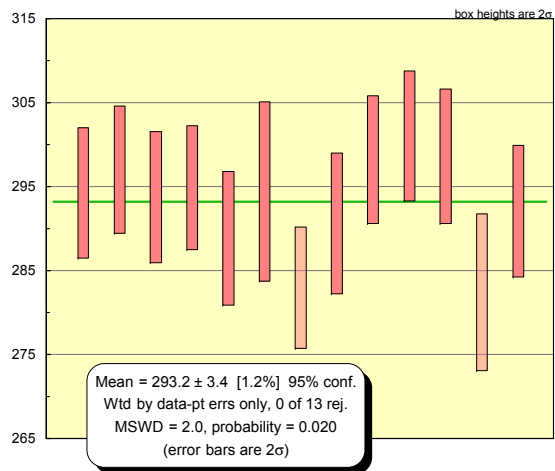
Figure 20 . Plots of SHRIMP U-Pb zircon data for sample RSC074A



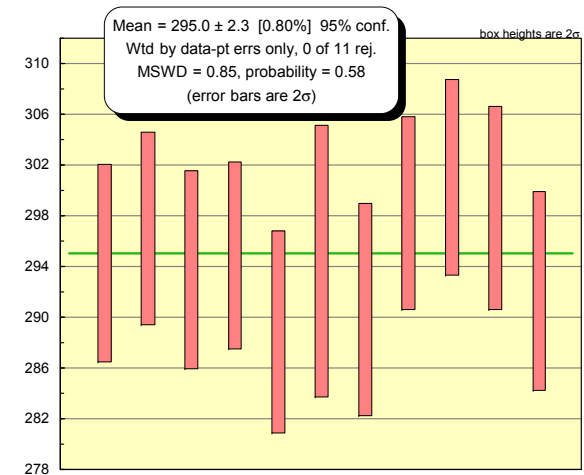
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

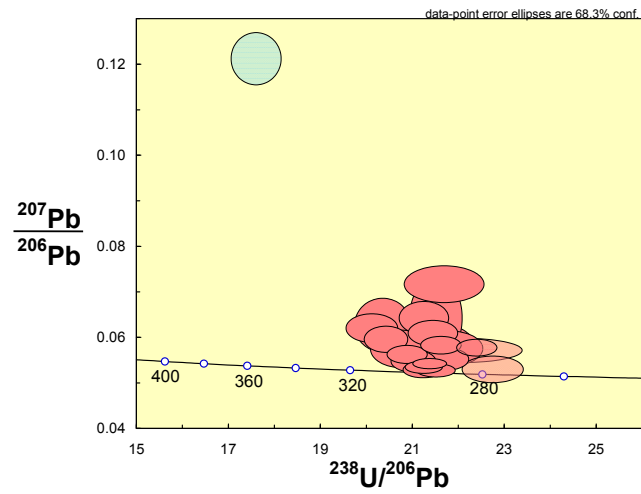
Table 21. Summary of SHRIMP U-Pb zircon analytical data for sample BB3399
 Leura Volcanics: crystal-rich dacitic ignimbrite. East of Nebo Creek, NEBO, MGA 674161 7610294

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	379	154	0.41	15.0	0.000093	0.07	21.506	0.272	0.0527	0.0010	0.0465	0.0006	292.8	3.7
1.2	337	126	0.37	13.5	-	0.26	21.371	0.242	0.0542	0.0007	0.0467	0.0005	294.1	3.3
2.1	87	199	2.28	3.7	0.000823	1.18	20.111	0.369	0.0620	0.0021	0.0491	0.0009	309.2	5.7
2.2	35	41	1.20	1.4	0.002356	2.46	21.683	0.572	0.0717	0.0027	0.0450	0.0012	283.7	7.5
3.1	114	325	2.86	4.6	0.001219	1.10	21.442	0.355	0.0610	0.0018	0.0461	0.0008	290.7	4.8
4.1	51	65	1.28	2.1	0.000000	0.63	20.742	0.439	0.0575	0.0027	0.0479	0.0010	301.7	6.4
4.2	65	102	1.55	2.8	-	0.89	20.416	0.314	0.0596	0.0019	0.0485	0.0008	305.6	4.7
5.1	407	1440	3.54	16.2	-	0.15	21.238	0.267	0.0535	0.0009	0.0470	0.0006	296.2	3.7
6.1	51	77	1.50	2.1	0.000340	0.84	21.359	0.623	0.0589	0.0029	0.0464	0.0014	292.6	8.5
7.1	136	210	1.55	5.4	-	0.40	21.710	0.339	0.0553	0.0016	0.0459	0.0007	289.2	4.5
7.2	149	242	1.62	5.9	0.000177	0.77	21.615	0.290	0.0583	0.0013	0.0459	0.0006	289.3	3.9
8.1	132	330	2.51	5.4	-	0.31	21.019	0.322	0.0548	0.0016	0.0474	0.0007	298.7	4.6
9.1	63	105	1.67	3.1	0.004148	8.48	17.584	0.360	0.1212	0.0038	0.0521	0.0013	327.1	7.7
10.1	248	796	3.20	10.1	0.000163	0.08	21.222	0.287	0.0529	0.0012	0.0471	0.0006	296.6	4.0
11.1	136	183	1.35	5.5	0.000565	0.22	21.322	0.344	0.0540	0.0017	0.0468	0.0008	294.8	4.7
12.1	106	295	2.79	4.0	-	0.15	22.745	0.440	0.0530	0.0019	0.0439	0.0009	277.0	5.3
13.1	61	109	1.78	2.4	0.000794	0.69	21.803	0.480	0.0576	0.0025	0.0455	0.0010	287.1	6.3
14.1	111	293	2.64	4.3	0.001020	0.65	22.055	0.876	0.0572	0.0018	0.0450	0.0018	284.0	11.1
15.1	105	58	0.55	4.4	0.001460	1.28	20.346	0.400	0.0627	0.0039	0.0485	0.0010	305.4	6.1
16.1	295	903	3.06	11.8	0.001094	1.52	21.503	0.378	0.0643	0.0060	0.0458	0.0009	288.7	5.5
17.1	226	548	2.43	9.3	-	0.49	20.879	0.289	0.0563	0.0013	0.0477	0.0007	300.1	4.1
18.1	163	345	2.13	6.2	-	0.74	22.398	0.286	0.0578	0.0012	0.0443	0.0006	279.5	3.6
19.1	70	103	1.48	2.8	0.000988	1.50	21.245	0.355	0.0642	0.0024	0.0464	0.0008	292.2	4.9

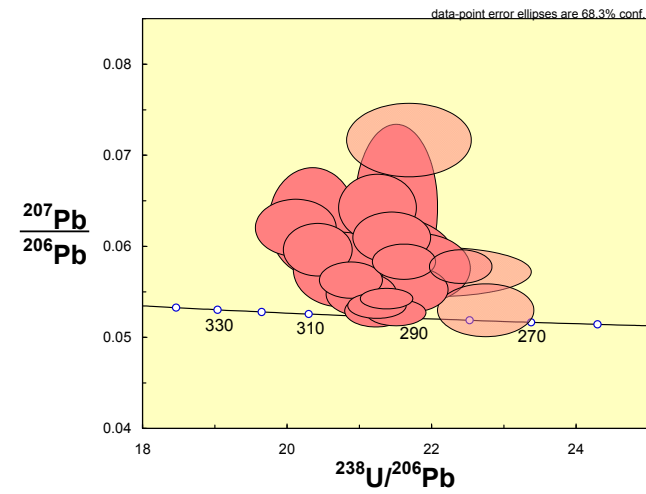
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.98% and 0.59% for the two analytical sessions.
(not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	± no std	± include std
293.5	2.2	4.0

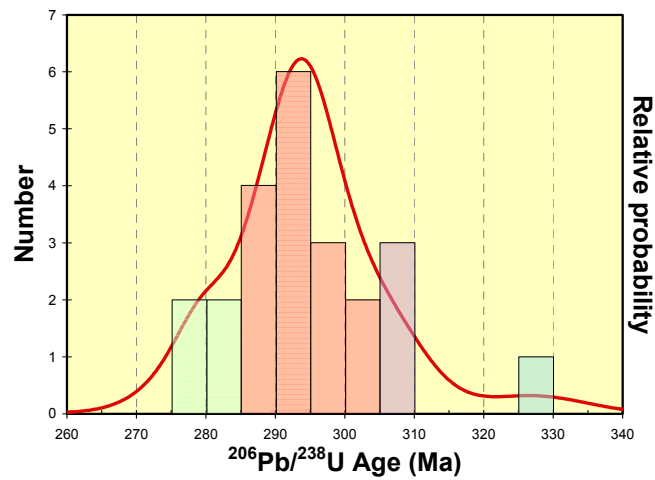
Figure 21. Plots of SHRIMP U-Pb zircon data for sample BB3399



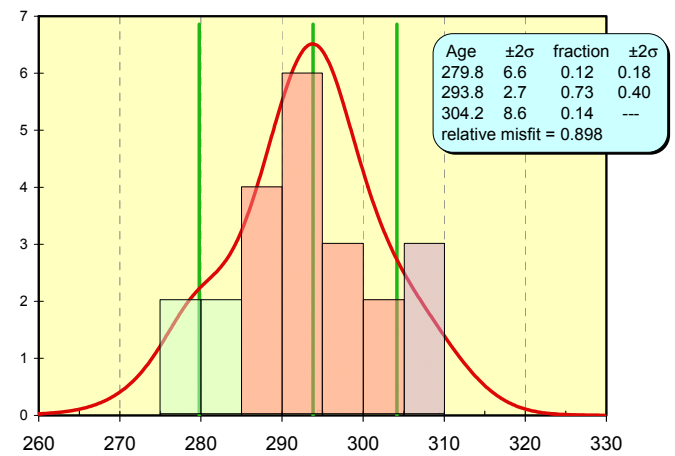
(a) Tera-Wasserburg plot, all analyses



(b) Tera-Wasserburg plot, - low common Pb

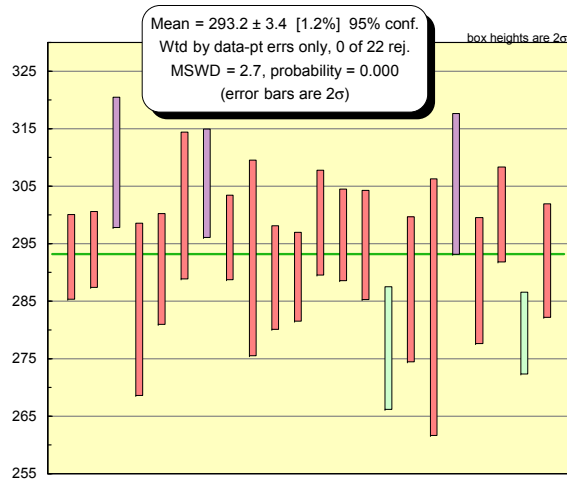


(c) Probability density plot – all grains

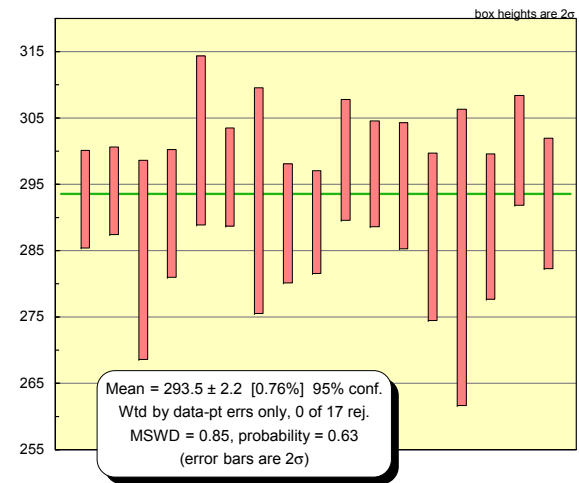


Probability density plot – main group, unmixed

Figure 21 (continued). Plots of SHRIMP U-Pb zircon data for sample BB3399



(e) Weighted average – most grains



(f) Weighted average – best estimate

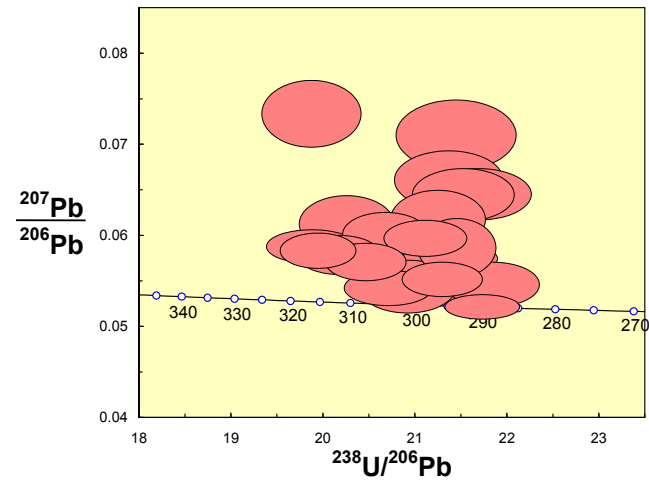
Table 22. Summary of SHRIMP U-Pb zircon analytical data for sample IWSC0897
 Leura Volcanics: crystal-rich ignimbrite. East of Wahroonga homestead, MOUNT BLUFFKIN, MGA 734500 7508950

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	123	85	0.69	5.0	0.002205	1.74	21.367	0.389	0.0661	0.0021	0.0460	0.0009	289.8	5.3
1.2	83	49	0.59	3.5	0.001154	1.09	20.252	0.341	0.0612	0.0021	0.0488	0.0008	307.4	5.2
2.1	276	237	0.86	11.6	0.000383	0.57	20.461	0.290	0.0571	0.0014	0.0486	0.0007	305.9	4.3
3.1	178	168	0.94	7.0	0.001016	1.56	21.690	0.381	0.0645	0.0018	0.0454	0.0008	286.1	5.0
4.1	227	296	1.30	9.2	0.001834	1.19	21.245	0.341	0.0617	0.0021	0.0465	0.0008	293.1	4.7
5.1	204	206	1.01	8.1	0.001161	1.54	21.523	0.366	0.0644	0.0019	0.0457	0.0008	288.4	4.9
6.1	176	143	0.81	7.1	0.001295	2.36	21.445	0.431	0.0710	0.0025	0.0455	0.0009	287.0	5.8
7.1	359	410	1.14	14.1	0.000619	0.32	21.843	0.337	0.0546	0.0016	0.0456	0.0007	287.7	4.4
8.1	298	288	0.97	12.0	0.000041	0.23	21.341	0.439	0.0541	0.0010	0.0467	0.0010	294.5	6.0
9.1	167	142	0.85	7.1	0.000163	0.66	20.171	0.299	0.0578	0.0014	0.0493	0.0007	309.9	4.6
10.1	144	151	1.04	6.0	0.001100	0.96	20.672	0.308	0.0601	0.0016	0.0479	0.0007	301.7	4.5
11.1	279	227	0.81	11.2	0.000795	0.81	21.457	0.279	0.0586	0.0021	0.0462	0.0006	291.3	3.8
12.1	196	148	0.75	8.0	0.000552	0.65	21.214	0.450	0.0574	0.0013	0.0468	0.0010	295.0	6.2
13.1	213	270	1.27	8.6	0.000449	0.37	21.295	0.290	0.0552	0.0013	0.0468	0.0006	294.8	4.0
14.1	180	200	1.11	7.5	0.000206	0.23	20.706	0.317	0.0542	0.0013	0.0482	0.0007	303.4	4.6
15.1	99	63	0.64	4.1	-0.000414	0.25	20.914	0.350	0.0544	0.0019	0.0477	0.0008	300.3	5.0
16.1	401	354	0.88	15.9	0.000398	0.00	21.731	0.269	0.0521	0.0009	0.0460	0.0006	290.0	3.6
17.1	70	50	0.72	3.0	0.002266	2.59	19.870	0.356	0.0733	0.0024	0.0490	0.0009	308.5	5.6
18.1	191	154	0.81	8.2	0.000527	0.71	19.940	0.273	0.0583	0.0013	0.0498	0.0007	313.3	4.3
19.1	191	158	0.83	7.8	0.000886	0.93	21.109	0.298	0.0597	0.0013	0.0469	0.0007	295.7	4.2
20.1	196	162	0.83	8.5	0.000486	0.76	19.876	0.327	0.0588	0.0012	0.0499	0.0008	314.1	5.1

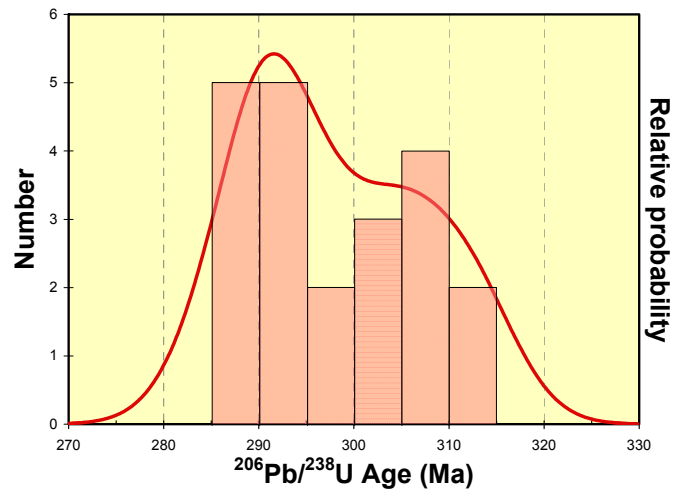
1. Uncertainties given at the one σ level.
2. Error in AS3 reference zircon calibration was 0.58% and 0.99% for the two analytical sessions. (not included in above errors but required when comparing data from different mounts).
3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
younger grouping	291.2	2.6	4.2
older grouping	307.1	3.1	4.7

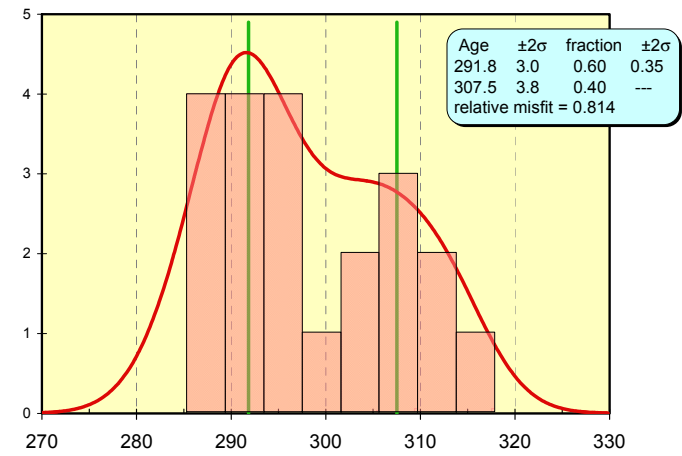
Figure 22. Plots of SHRIMP U-Pb zircon data for sample IWSC0897



(a) Tera-Wasserburg plot, all analyses

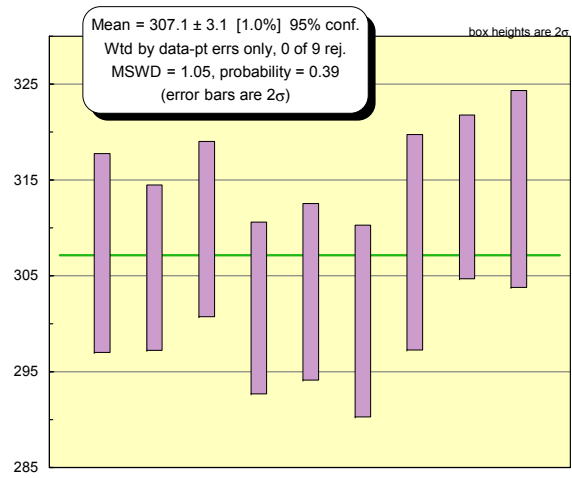


(b) Probability density plot – all grains

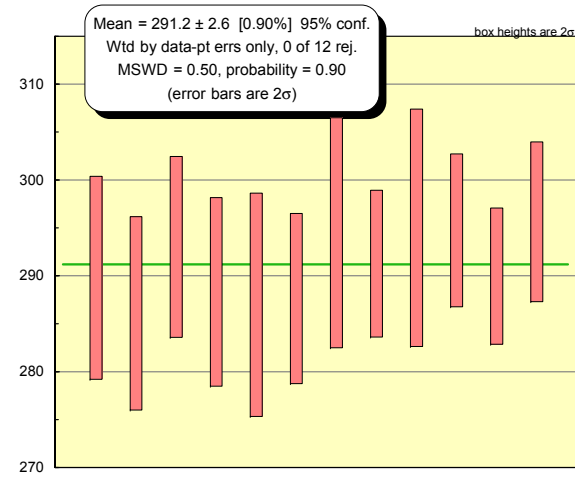


(d) Probability density plot – unmixed

Figure 22 (continued). Plots of SHRIMP U-Pb zircon data for sample IWSC0897



(e) Weighted average – older group



(f) Weighted average – younger group

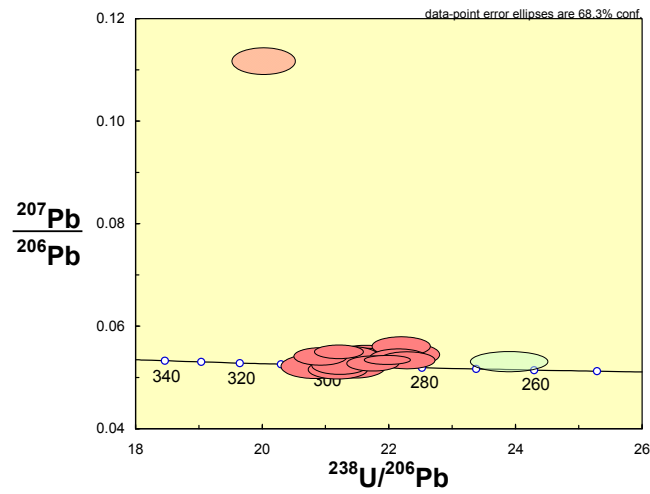
Table 23. Summary of SHRIMP U-Pb zircon analytical data for sample LHC878
 Leura Volcanics: hornfelsed rhyolite (thought to be intruded by LHC882). North of Iron Pot Mountain, CONNORS RANGE, MGA 716942 7547925

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	307	294	0.96	11.9	-	0.21	22.144	0.303	0.0536	0.0012	0.0451	0.0006	284.2	3.9
2.1	188	121	0.64	7.6	0.000314	<0.01	21.452	0.317	0.0519	0.0014	0.0466	0.0007	293.8	4.3
3.1	284	241	0.85	11.7	0.000117	0.21	20.908	0.278	0.0540	0.0011	0.0477	0.0006	300.5	4.0
4.1	146	96	0.66	5.8	-	0.21	21.625	0.340	0.0538	0.0016	0.0461	0.0007	290.8	4.5
5.1	318	336	1.06	11.4	0.000133	0.20	23.897	0.403	0.0531	0.0013	0.0418	0.0007	263.8	4.4
6.1	165	149	0.90	6.6	0.000002	0.16	21.596	0.325	0.0535	0.0014	0.0462	0.0007	291.3	4.4
7.1	287	281	0.98	12.3	0.002358	7.41	20.009	0.331	0.1116	0.0017	0.0463	0.0009	291.6	5.6
8.1	224	175	0.78	9.1	-	<0.01	21.216	0.292	0.0523	0.0012	0.0471	0.0007	296.9	4.0
9.1	1129	484	0.43	44.4	0.000026	0.16	21.965	0.240	0.0533	0.0006	0.0455	0.0005	286.6	3.1
10.1	264	214	0.81	10.2	0.000126	0.31	22.298	0.325	0.0544	0.0014	0.0447	0.0007	281.9	4.1
11.1	229	179	0.78	9.5	0.000404	<0.01	20.828	0.359	0.0521	0.0015	0.0480	0.0008	302.4	5.2
12.1	244	189	0.78	9.9	-	<0.01	21.184	0.309	0.0515	0.0012	0.0473	0.0007	297.6	4.3
13.1	242	168	0.69	9.4	0.000403	0.51	22.184	0.306	0.0560	0.0013	0.0448	0.0006	282.8	3.9
14.1	112	76	0.68	4.6	0.000127	0.02	21.159	0.361	0.0524	0.0018	0.0473	0.0008	297.6	5.0
15.1	373	250	0.67	14.8	-	0.07	21.737	0.273	0.0526	0.0009	0.0460	0.0006	289.8	3.6
16.1	202	122	0.61	8.2	0.000492	0.22	21.375	0.307	0.0540	0.0013	0.0467	0.0007	294.1	4.2
15.2	307	268	0.87	11.8	-	0.17	22.278	0.292	0.0533	0.0011	0.0448	0.0006	282.6	3.7
17.1	430	536	1.24	17.5	0.000289	0.33	21.201	0.257	0.0549	0.0009	0.0470	0.0006	296.1	3.6

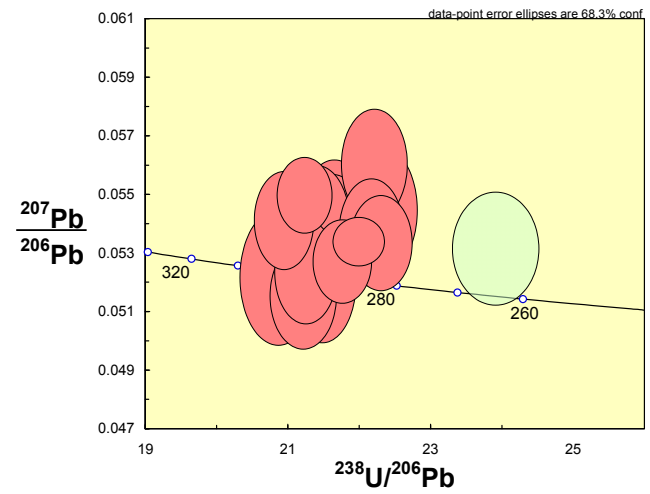
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.80% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
single estimate	292.0	2.9	3.7

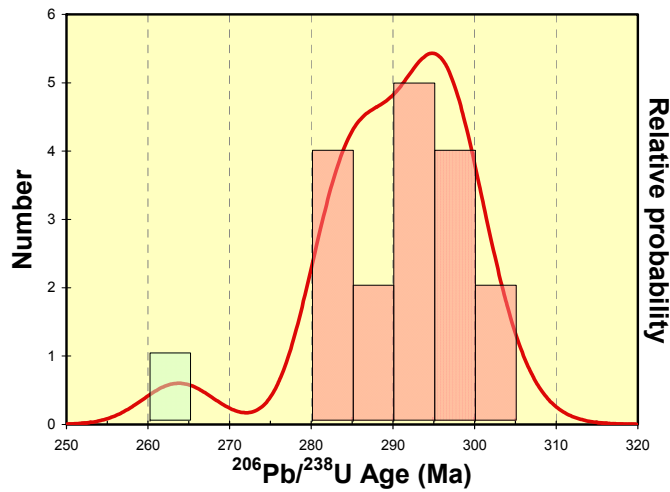
Figure 23. Plots of SHRIMP U-Pb zircon data for sample LHC878



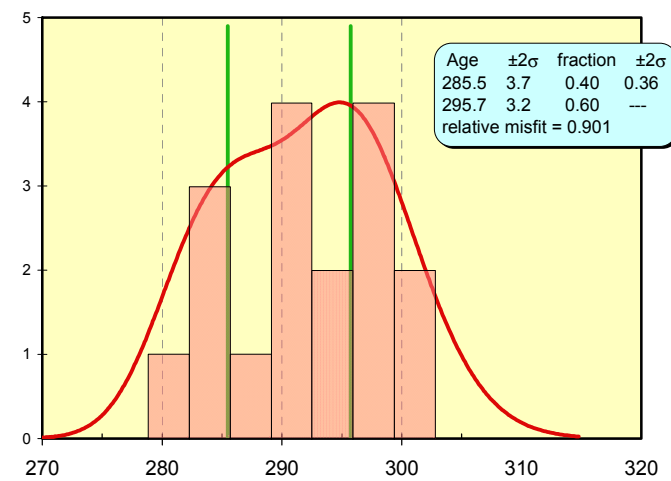
(a) Tera-Wasserburg plot, all analyses



(b) Tera-Wasserburg plot, - low common Pb

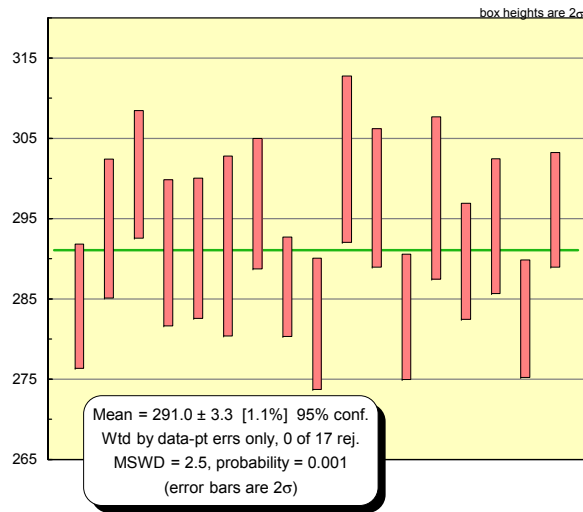


(c) Probability density plot – all grains

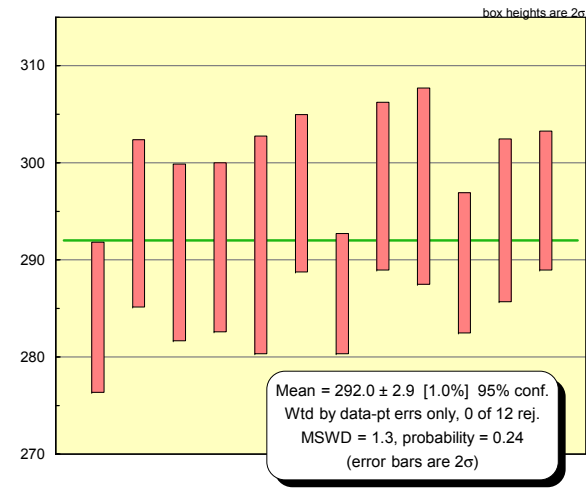


(d) Probability density plot – unmixed

Figure 23 (continued). Plots of SHRIMP U-Pb zircon data for sample LHC878



(e) Weighted average – most grains



(f) Weighted average – an estimate

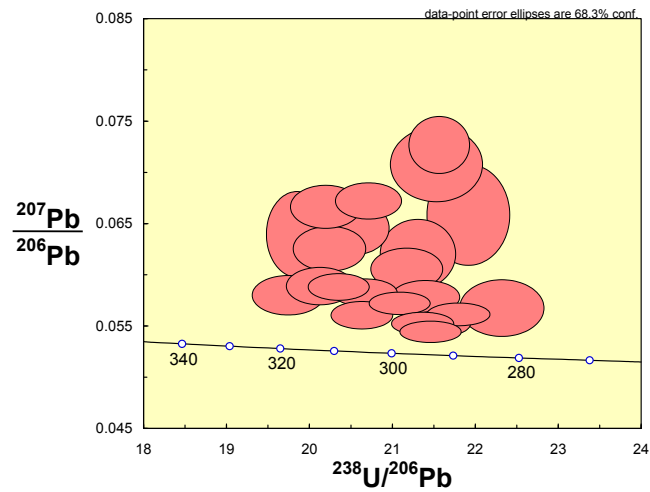
Table 24. Summary of SHRIMP U-Pb zircon analytical data for sample BB3050A
 Carmila beds: rhyodacite ignimbrite. nNar Koumala, CARMILA, MGA 750671 7566261

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	319	600	1.88	12.7	0.000330	0.38	21.556	0.253	0.0552	0.0008	0.0462	0.0005	291.2	3.4
1.2	307	523	1.70	12.0	-	1.73	21.908	0.330	0.0659	0.0032	0.0449	0.0007	282.8	4.4
2.1	237	223	0.94	9.9	0.000684	0.73	20.667	0.254	0.0583	0.0009	0.0480	0.0006	302.4	3.7
3.1	250	220	0.88	10.5	0.000521	0.79	20.345	0.241	0.0588	0.0009	0.0488	0.0006	306.9	3.6
4.1	327	245	0.75	13.3	0.000382	0.62	21.084	0.247	0.0572	0.0007	0.0471	0.0006	296.9	3.4
15.1	111	85	0.77	4.6	0.000312	1.52	20.540	0.277	0.0646	0.0017	0.0479	0.0007	301.9	4.1
6.1	328	295	0.90	13.1	0.000234	0.28	21.461	0.243	0.0544	0.0007	0.0465	0.0005	292.8	3.3
7.1	154	149	0.97	6.2	0.000387	0.71	21.395	0.273	0.0578	0.0011	0.0464	0.0006	292.4	3.7
8.1	101	123	1.21	4.3	0.001281	1.76	20.194	0.281	0.0666	0.0014	0.0486	0.0007	306.2	4.3
9.1	161	139	0.87	6.5	0.000894	1.23	21.305	0.299	0.0620	0.0022	0.0464	0.0007	292.1	4.1
10.1	299	372	1.24	12.0	0.000380	0.38	21.359	0.244	0.0552	0.0007	0.0466	0.0005	293.9	3.3
11.1	117	131	1.12	5.0	0.000635	0.79	20.123	0.267	0.0589	0.0012	0.0493	0.0007	310.2	4.1
12.1	211	132	0.62	8.8	0.000270	0.45	20.625	0.245	0.0561	0.0009	0.0483	0.0006	303.9	3.6
13.1	411	355	0.86	16.4	0.001400	2.58	21.560	0.239	0.0727	0.0018	0.0452	0.0005	284.9	3.3
13.2	354	295	0.83	13.6	0.000653	0.61	22.320	0.335	0.0568	0.0018	0.0445	0.0007	280.9	4.2
14.1	158	175	1.11	6.5	0.001284	1.85	20.710	0.265	0.0672	0.0012	0.0474	0.0006	298.5	3.8
15.1	339	245	0.72	13.4	0.000383	0.51	21.793	0.248	0.0561	0.0007	0.0457	0.0005	287.8	3.3
16.1	112	103	0.93	4.9	0.000594	0.66	19.737	0.287	0.0580	0.0013	0.0503	0.0007	316.6	4.6
17.1	209	90	0.43	9.0	0.001200	1.41	19.838	0.244	0.0639	0.0028	0.0497	0.0006	312.7	4.0
18.1	99	82	0.83	4.2	0.001070	1.25	20.234	0.290	0.0626	0.0014	0.0488	0.0007	307.2	4.4
18.2	270	328	1.21	10.8	0.000763	2.34	21.524	0.364	0.0708	0.0024	0.0454	0.0008	286.1	4.9
19.1	111	98	0.88	4.5	0.000332	1.04	21.168	0.291	0.0606	0.0013	0.0468	0.0007	294.5	4.0

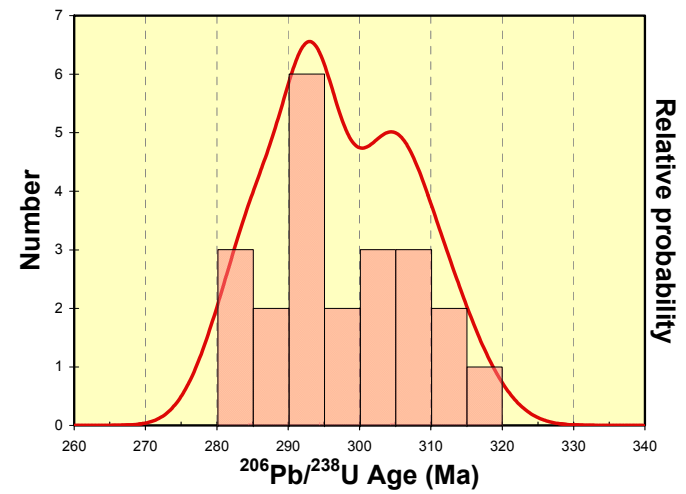
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.58% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
younger group	292.8	2.3	2.9
older group	305.4	2.9	3.4

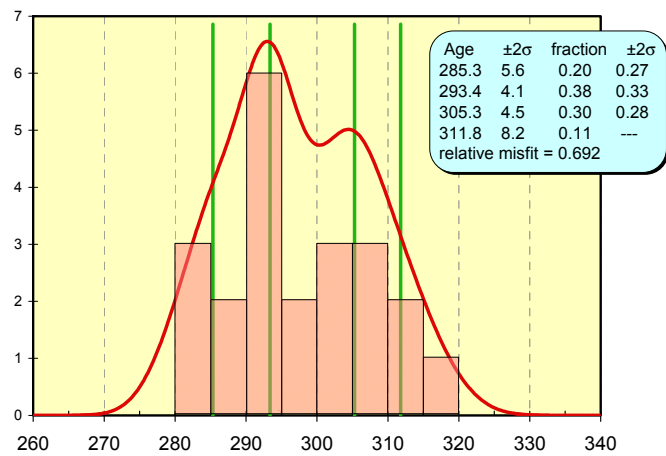
Figure 24. Plots of SHRIMP U-Pb zircon data for sample BB3050A



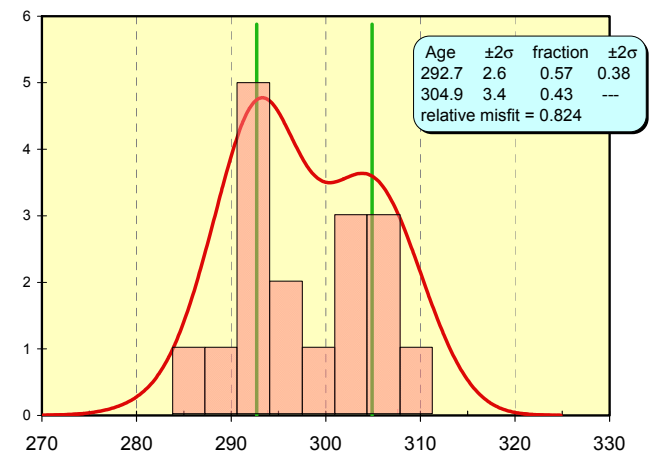
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains

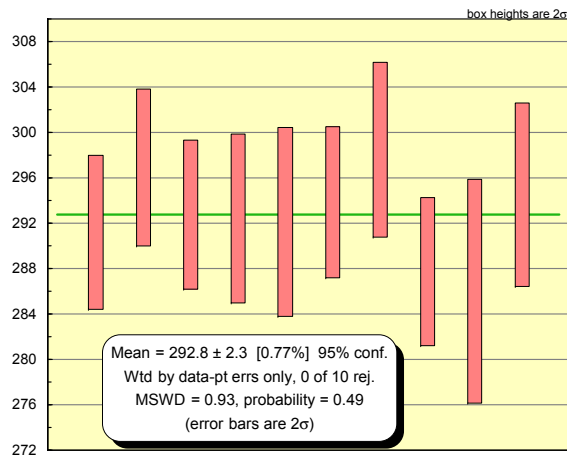


(c) Probability density plot – unmixed possibilities

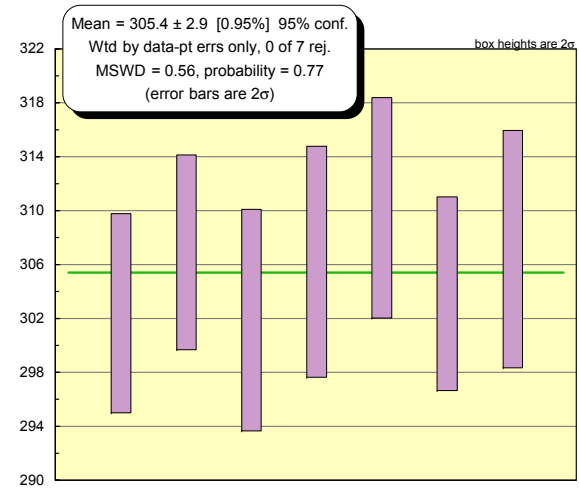


(d) Probability density plot –selected unmixed

Figure 24 (continued). Plots of SHRIMP U-Pb zircon data for sample BB3050A



(e) Weighted average – younger group



(f) Weighted average older group

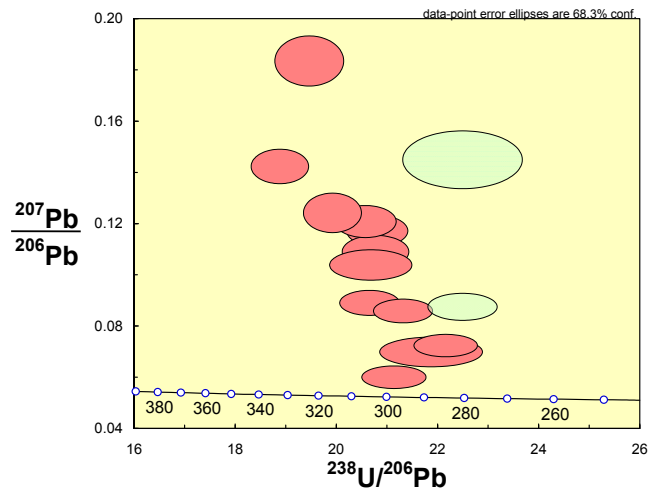
Table 25. Summary of SHRIMP U-Pb zircon analytical data for sample RSC011
Lizzie Creek Volcanic Group: crystal-rich dacitic ignimbrite. North of Eungella Dam, HILLALONG, MGA 636475 7667820

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	51	53	1.06	2.1	0.004185	4.59	20.643	0.389	0.0890	0.0032	0.0462	0.0009	291.3	5.8
2.1	31	27	0.89	1.2	-	2.24	21.861	0.671	0.0699	0.0038	0.0447	0.0014	282.0	8.7
3.1	61	57	0.94	2.5	0.000526	4.22	21.308	0.387	0.0858	0.0031	0.0449	0.0009	283.4	5.4
4.1	51	54	1.05	2.1	-	8.13	20.796	0.399	0.1171	0.0040	0.0442	0.0010	278.7	6.3
5.1	30	23	0.77	1.2	-	11.70	22.485	0.783	0.1449	0.0075	0.0393	0.0016	248.3	9.8
6.1	47	45	0.94	1.8	0.001218	4.47	22.489	0.450	0.0874	0.0035	0.0425	0.0009	268.2	5.6
7.1	50	50	1.00	2.0	-	0.97	21.128	0.420	0.0600	0.0029	0.0469	0.0010	295.3	5.9
8.1	38	35	0.92	1.6	0.001327	7.10	20.766	0.435	0.1089	0.0043	0.0447	0.0011	282.1	6.6
9.1	47	44	0.93	2.0	-	8.59	20.563	0.401	0.1208	0.0041	0.0445	0.0010	280.4	6.5
10.1	53	56	1.04	2.1	0.000160	2.55	22.150	0.414	0.0723	0.0029	0.0440	0.0009	277.5	5.3
11.1	29	27	0.93	1.3	0.006134	16.42	19.451	0.452	0.1834	0.0064	0.0430	0.0015	271.2	9.4
12.1	47	48	1.02	2.0	-	8.97	19.911	0.381	0.1241	0.0050	0.0457	0.0011	288.2	6.8
13.1	40	40	1.01	1.7	0.003049	6.45	20.667	0.538	0.1038	0.0039	0.0453	0.0013	285.4	7.8
14.1	39	43	1.10	1.8	0.008017	11.20	18.863	0.375	0.1422	0.0045	0.0471	0.0012	296.5	7.6

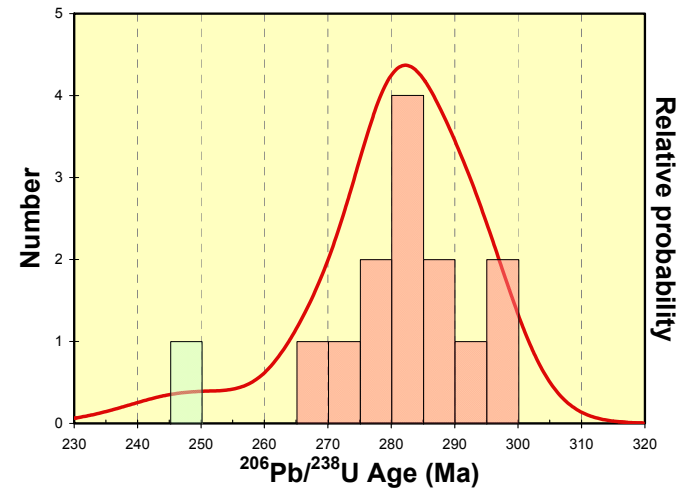
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.86% for the analytical session.
(not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	± no std	± include std
284.7	3.7	4.4

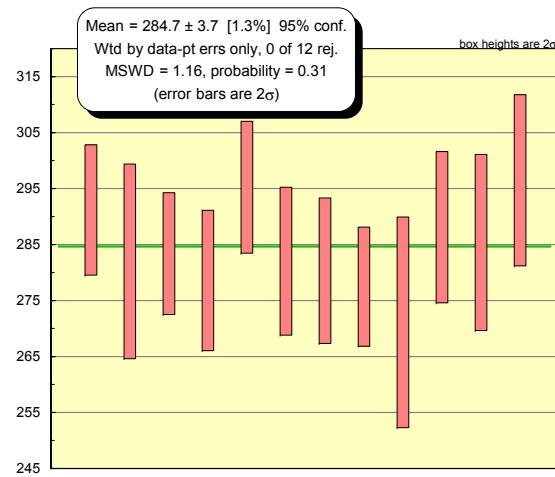
Figure 25. Plots of SHRIMP U-Pb zircon data for sample RSC011



(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – most grains

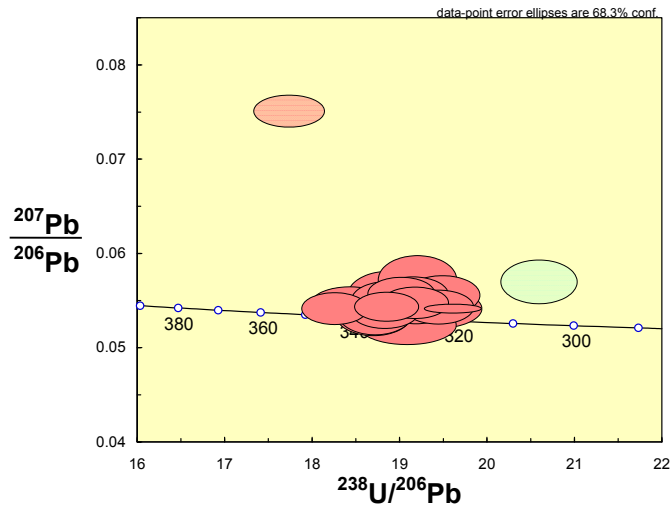
Table 26. Summary of SHRIMP U-Pb zircon analytical data for sample IWSC0733
Burwood Complex: hornblende-biotite granodiorite. North of Burwood, MOUNT BLUFFKIN, MGA 745201 7507469

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	195	116	0.60	9.2	0.000009	0.10	18.249	0.246	0.0541	0.0011	0.0547	0.0008	343.6	4.6
2.1	115	63	0.54	5.2	0.000471	0.53	19.201	0.296	0.0572	0.0017	0.0518	0.0008	325.6	5.0
3.1	104	54	0.51	4.8	0.000235	0.05	18.696	0.286	0.0536	0.0015	0.0535	0.0008	335.7	5.1
4.1	177	144	0.82	7.4	0.000187	0.57	20.589	0.289	0.0570	0.0015	0.0483	0.0007	304.0	4.2
5.1	140	74	0.53	6.2	0.001040	0.34	19.485	0.283	0.0556	0.0014	0.0511	0.0008	321.6	4.6
6.1	214	137	0.64	9.7	0.000697	0.34	19.013	0.253	0.0557	0.0011	0.0524	0.0007	329.4	4.3
7.1	161	83	0.52	7.5	-	0.17	18.423	0.296	0.0546	0.0012	0.0542	0.0009	340.2	5.4
8.1	150	92	0.61	6.8	0.000422	0.24	18.843	0.264	0.0551	0.0013	0.0529	0.0008	332.6	4.6
9.1	119	70	0.59	5.4	0.000602	0.06	18.716	0.282	0.0536	0.0015	0.0534	0.0008	335.4	5.0
10.1	82	40	0.49	3.7	-	0.30	18.863	0.308	0.0555	0.0017	0.0529	0.0009	332.0	5.4
10.2	231	185	0.80	10.4	-	0.22	19.171	0.252	0.0548	0.0011	0.0520	0.0007	327.1	4.3
11.1	126	86	0.68	5.6	-	0.16	19.373	0.373	0.0541	0.0014	0.0515	0.0010	323.9	6.2
12.1	160	121	0.75	7.2	0.000641	0.18	19.181	0.268	0.0544	0.0013	0.0520	0.0007	327.0	4.5
13.1	163	93	0.57	7.3	0.000056	0.33	19.147	0.268	0.0556	0.0013	0.0521	0.0007	327.1	4.5
13.2	2802	159	0.06	122.8	0.000013	0.17	19.603	0.216	0.0541	0.0003	0.0509	0.0006	320.2	3.5
14.1	256	205	0.80	11.7	-	0.15	18.846	0.243	0.0543	0.0010	0.0530	0.0007	332.8	4.2
15.1	176	92	0.53	8.0	-	0.09	18.823	0.259	0.0539	0.0012	0.0531	0.0007	333.4	4.5
16.1	190	111	0.58	8.4	-	0.18	19.441	0.264	0.0543	0.0012	0.0513	0.0007	322.8	4.3
17.1	735	174	0.24	35.6	0.001772	2.69	17.726	0.267	0.0751	0.0011	0.0549	0.0009	344.5	5.3
18.1	134	76	0.57	6.0	-	<0.01	19.084	0.369	0.0524	0.0013	0.0524	0.0010	329.5	6.3

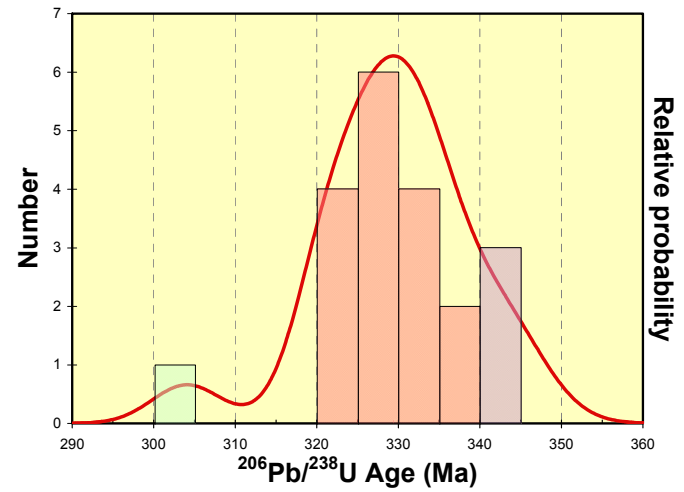
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.82% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
dominant	328.0	2.7	3.8

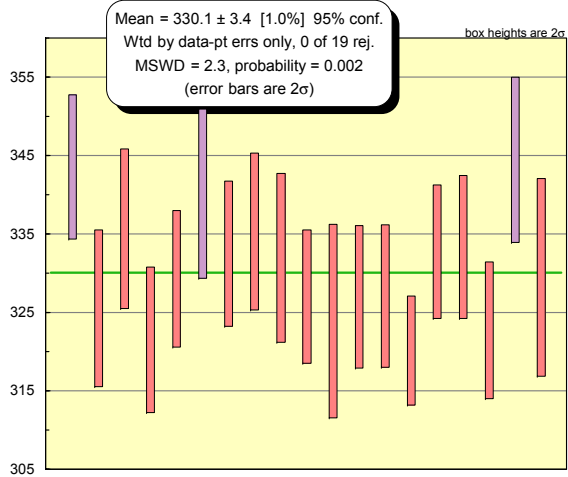
Figure 26. Plots of SHRIMP U-Pb zircon data for sample IWSC0733



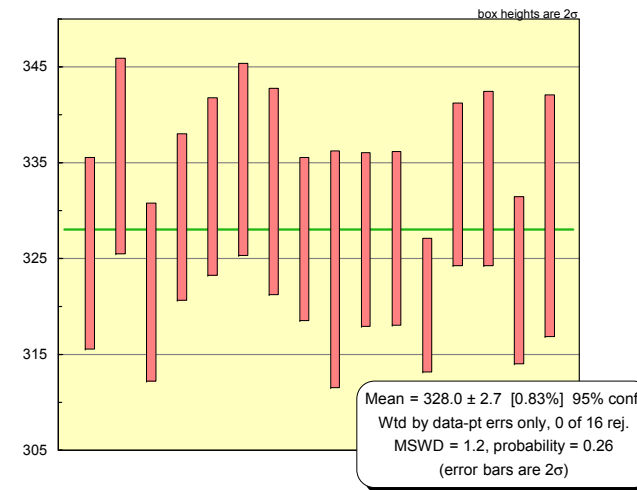
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

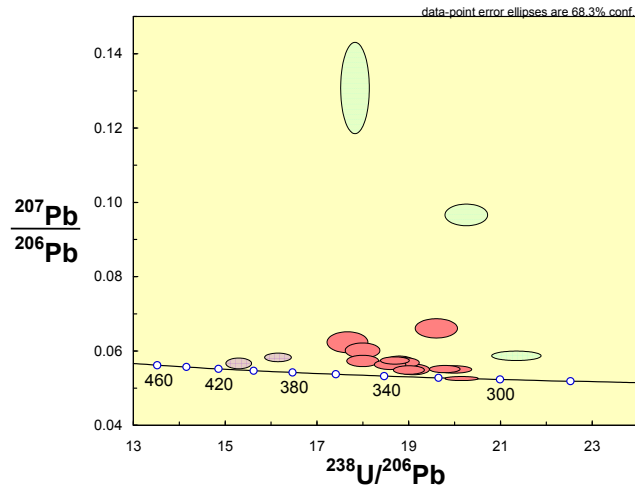
Table 27. Summary of SHRIMP U-Pb zircon analytical data for sample LHC091
 Hazlewood Granite: biotite granite. Headwaters of Oaky Creek, south of Carmila, CONNORS RANGE, MGA 750900 7560420

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	349	339	0.97	16.0	0.000301	0.47	18.788	0.228	0.0569	0.0012	0.0530	0.0007	332.8	4.0
1.2	319	303	0.95	14.4	0.000060	0.26	19.089	0.235	0.0551	0.0009	0.0522	0.0007	328.3	4.0
2.1	616	356	0.58	26.8	0.000177	0.30	19.780	0.222	0.0551	0.0007	0.0504	0.0006	317.0	3.5
3.1	330	103	0.31	15.0	0.000509	0.48	18.878	0.226	0.0569	0.0009	0.0527	0.0006	331.2	3.9
4.1	386	225	0.58	17.5	0.000339	0.23	18.994	0.220	0.0549	0.0008	0.0525	0.0006	330.0	3.8
5.1	1804	2379	1.32	76.9	0.000101	<0.01	20.147	0.239	0.0526	0.0004	0.0496	0.0006	312.3	3.6
6.1	591	427	0.72	25.4	0.000187	0.30	19.990	0.250	0.0550	0.0006	0.0499	0.0006	313.8	3.9
6.2	750	571	0.76	30.2	0.000078	0.82	21.342	0.356	0.0588	0.0009	0.0465	0.0008	292.8	4.8
7.1	446	331	0.74	23.8	0.000737	0.49	16.133	0.191	0.0583	0.0008	0.0617	0.0007	385.8	4.5
8.1	168	111	0.66	8.0	0.000559	0.49	17.982	0.228	0.0574	0.0010	0.0553	0.0007	347.2	4.4
8.2	103	58	0.56	5.0	0.001070	1.10	17.654	0.292	0.0624	0.0018	0.0560	0.0009	351.4	5.8
9.1	286	113	0.40	13.8	0.005800	9.69	17.818	0.208	0.1307	0.0081	0.0507	0.0011	318.7	6.6
10.1	255	86	0.34	14.3	0.001821	0.22	15.279	0.186	0.0567	0.0009	0.0653	0.0008	407.8	4.9
11.1	292	120	0.41	25.7	0.025294	44.45	9.765	0.142	0.4124	0.0108	0.0569	0.0059	356.7	36.1
12.1	224	73	0.33	10.3	-	0.39	18.582	0.224	0.0563	0.0009	0.0536	0.0007	336.6	4.0
13.1	102	52	0.51	4.9	0.001306	0.84	17.983	0.251	0.0602	0.0013	0.0551	0.0008	346.0	4.8
14.1	407	381	0.94	18.7	0.000296	0.54	18.683	0.208	0.0575	0.0006	0.0532	0.0006	334.4	3.7
15.1	607	226	0.37	25.8	0.001774	5.53	20.248	0.310	0.0966	0.0019	0.0467	0.0008	294.0	5.0
16.1	331	176	0.53	14.5	-	1.67	19.591	0.304	0.0661	0.0017	0.0502	0.0008	315.7	4.9

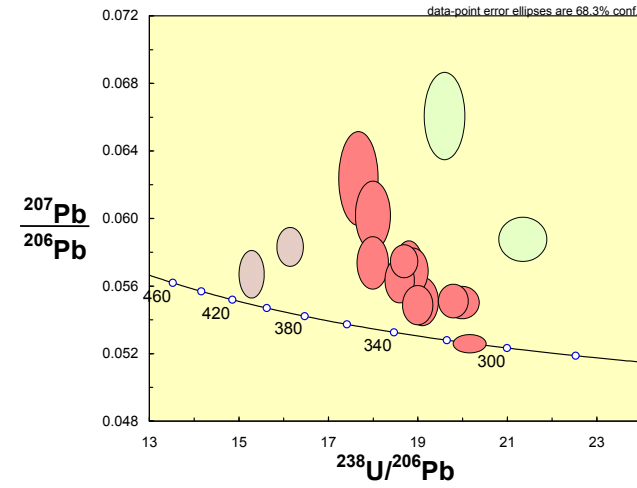
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.58% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera and Wasserburg (1972) as outlined in Williams (1998).

Age ± no std
 magmatic 314.9 3.0

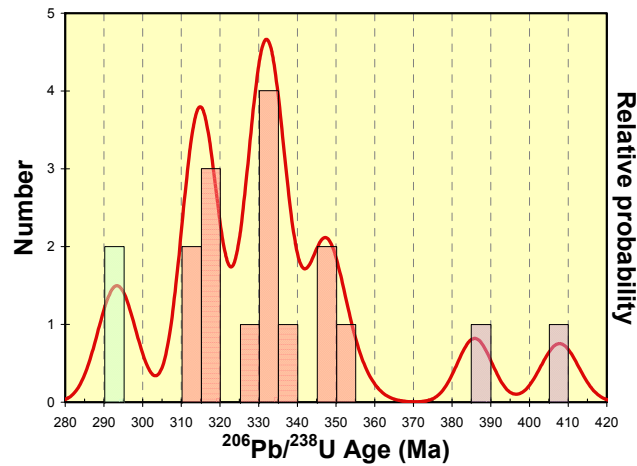
Figure 27. Plots of SHRIMP U-Pb zircon data for sample LHC091



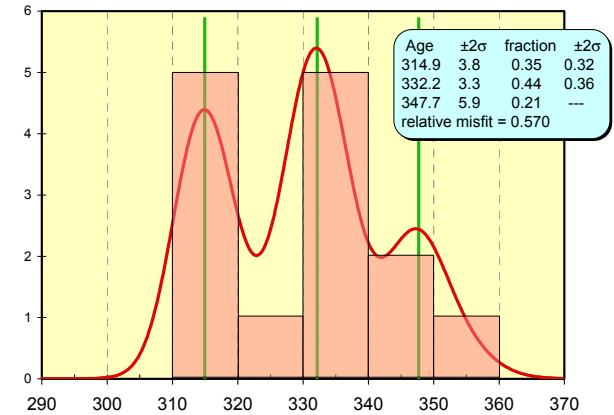
(a) Tera-Wasserburg plot, most analyses



(b) Tera-Wasserburg plot, lower common lead



(c) Probability density plot – most grains



(d) Probability density plot showing unmixing of Carboniferous grains

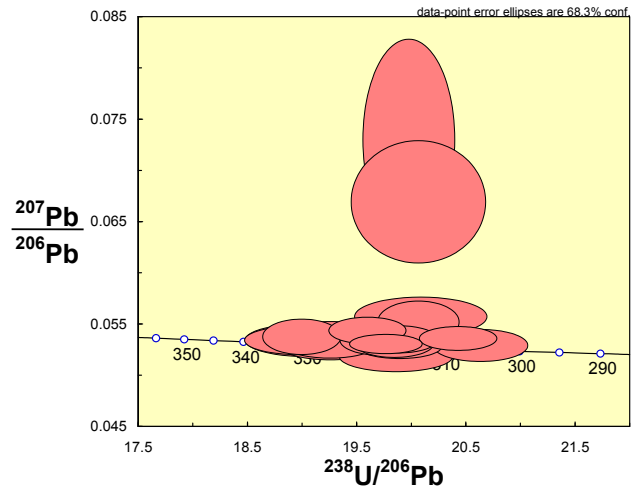
Table 28. Summary of SHRIMP U-Pb zircon analytical data for sample IWSC0601
Bora Creek Quartz Monzodiorite: hornblende-biotite quartz monzodiorite. Broadsound Range, MOUNT BLUFFKIN, MGA 747231 7485675

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	264	244	0.93	11.3	0.000303	0.32	20.059	0.246	0.0552	0.0013	0.0497	0.0006	312.6	3.8
2.1	357	275	0.77	15.3	0.000909	1.79	20.060	0.406	0.0669	0.0039	0.0490	0.0010	308.1	6.4
3.1	147	105	0.71	6.3	0.002005	2.54	19.972	0.276	0.0729	0.0065	0.0488	0.0008	307.1	5.0
4.1	208	172	0.82	8.9	0.000340	0.39	20.081	0.401	0.0557	0.0013	0.0496	0.0010	312.1	6.2
5.1	538	693	1.29	23.2	0.000051	0.02	19.889	0.256	0.0528	0.0008	0.0503	0.0007	316.2	4.0
6.1	368	294	0.80	15.5	0.000042	0.13	20.424	0.236	0.0536	0.0008	0.0489	0.0006	307.7	3.5
7.1	190	149	0.79	8.6	0.000119	0.08	18.991	0.235	0.0537	0.0011	0.0526	0.0007	330.5	4.0
8.1	190	161	0.85	8.6	0.000488	0.04	18.982	0.340	0.0534	0.0009	0.0527	0.0010	330.8	5.8
9.1	235	157	0.67	10.2	0.000040	0.04	19.840	0.238	0.0531	0.0009	0.0504	0.0006	316.9	3.8
10.1	211	197	0.94	9.1	0.000110	<0.01	19.854	0.344	0.0518	0.0010	0.0504	0.0009	317.1	5.4
11.1	245	219	0.89	10.7	0.000430	0.20	19.594	0.234	0.0544	0.0009	0.0509	0.0006	320.3	3.8
12.1	224	192	0.86	10.0	-	0.05	19.254	0.349	0.0533	0.0012	0.0519	0.0010	326.2	5.8
13.1	480	564	1.18	20.9	0.000045	0.04	19.763	0.221	0.0530	0.0006	0.0506	0.0006	318.1	3.5
14.1	166	136	0.82	7.5	-	0.05	19.035	0.371	0.0534	0.0011	0.0525	0.0010	329.9	6.3
15.1	269	259	0.97	11.6	0.000049	0.10	19.882	0.237	0.0535	0.0009	0.0502	0.0006	316.0	3.7
16.1	182	127	0.70	7.6	0.000310	0.06	20.628	0.287	0.0529	0.0010	0.0485	0.0007	305.0	4.2
17.1	202	147	0.73	9.0	0.000195	0.02	19.249	0.288	0.0531	0.0009	0.0519	0.0008	326.4	4.8
18.1	220	194	0.88	9.6	0.000275	0.08	19.708	0.242	0.0534	0.0010	0.0507	0.0006	318.8	3.9

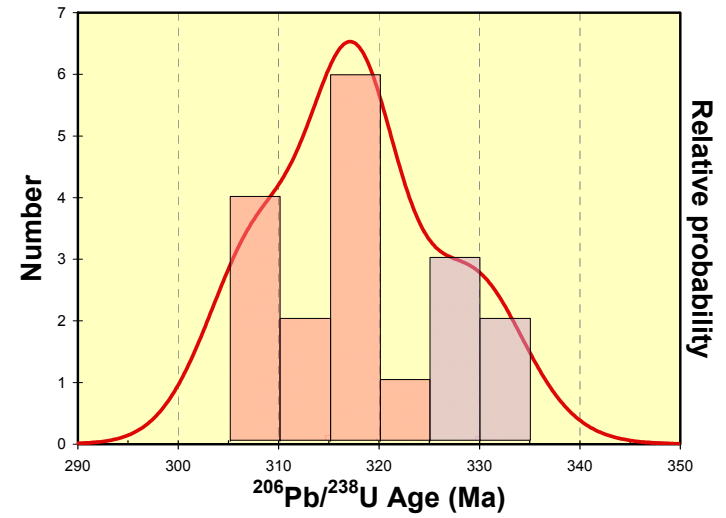
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.68% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
dominant grouping	316.4	2.6	3.4
dominant grouping	328.9	4.5	5.0

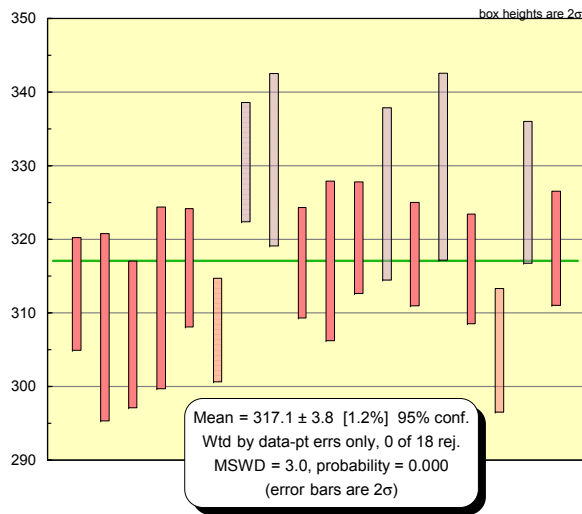
Figure 28. Plots of SHRIMP U-Pb zircon data for sample IWSC0601



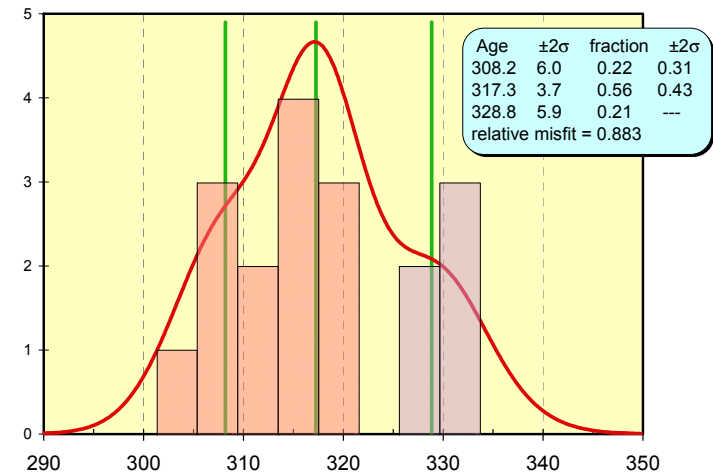
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains

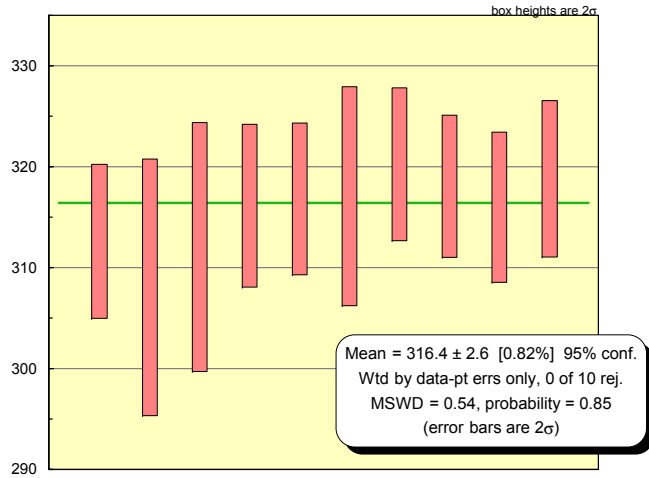


(c) Weighted average – all grains

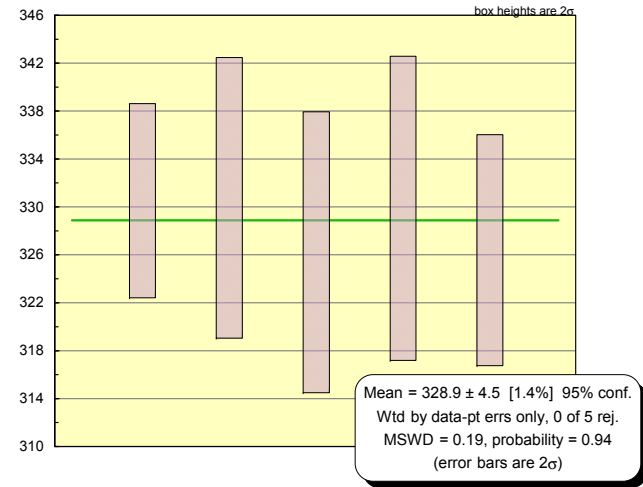


(d) Probability density plot – unmixed

Figure 28 (continued). Plots of SHRIMP U-Pb zircon data for sample IWSC0601



(e) Weighted average – dominant group



(f) Weighted average – older group

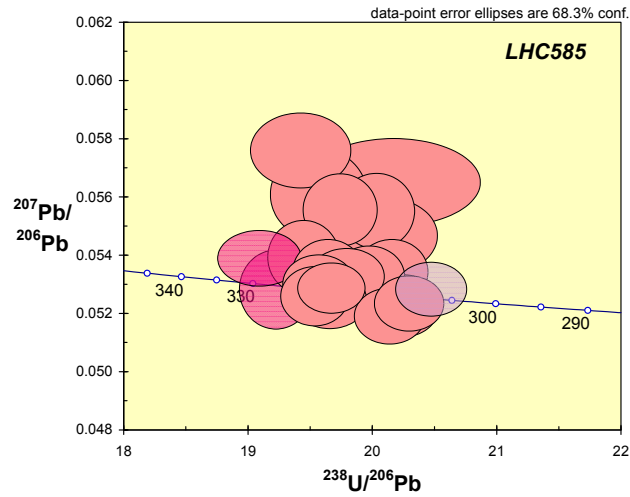
Table 29. Summary of SHRIMP U-Pb zircon analytical data for sample LHC585
Dacey Granite: hornblende-biotite granite. East of Dacey homestead, CONNORS RANGE, MGA 734425 7544556

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	263	128	0.49	11.6	-	0.13	19.448	0.191	0.0539	0.0008	0.0514	0.0005	322.8	3.1
2.1	386	271	0.70	16.6	0.000181	0.07	19.977	0.189	0.0532	0.0007	0.0500	0.0005	314.7	2.9
3.1	296	161	0.54	12.4	0.000171	0.04	20.475	0.188	0.0528	0.0006	0.0488	0.0005	307.3	2.8
4.1	223	115	0.52	9.7	0.000398	0.08	19.646	0.187	0.0534	0.0007	0.0509	0.0005	319.8	3.0
5.1	142	90	0.63	6.3	0.000059	<0.01	19.228	0.194	0.0528	0.0009	0.0520	0.0005	326.9	3.3
6.1	356	171	0.48	16.0	0.000513	0.11	19.094	0.221	0.0539	0.0006	0.0523	0.0006	328.7	3.8
7.1	297	201	0.68	12.9	0.000010	0.06	19.794	0.199	0.0533	0.0006	0.0505	0.0005	317.5	3.2
8.1	281	170	0.61	11.9	0.000101	<0.01	20.296	0.187	0.0523	0.0006	0.0493	0.0005	310.1	2.8
9.1	504	319	0.63	22.0	0.000060	<0.01	19.657	0.195	0.0524	0.0006	0.0509	0.0005	320.0	3.1
10.1	235	119	0.51	10.3	0.000074	<0.01	19.539	0.182	0.0526	0.0007	0.0512	0.0005	321.9	3.0
11.1	262	132	0.50	11.2	0.000165	<0.01	20.142	0.186	0.0519	0.0006	0.0497	0.0005	312.6	2.9
12.1	208	162	0.78	8.8	0.000223	<0.01	20.253	0.191	0.0522	0.0007	0.0494	0.0005	310.8	2.9
13.1	297	211	0.71	13.0	-	0.01	19.673	0.178	0.0529	0.0006	0.0508	0.0005	319.6	2.9
14.1	201	85	0.42	8.6	0.000208	0.10	20.161	0.191	0.0534	0.0007	0.0495	0.0005	311.8	2.9
15.1	251	164	0.65	11.0	0.000212	0.02	19.569	0.193	0.0530	0.0007	0.0511	0.0005	321.2	3.1
16.1	429	336	0.78	18.7	0.000515	0.35	19.745	0.197	0.0556	0.0008	0.0505	0.0005	317.4	3.1
17.1	433	307	0.71	19.2	0.000215	0.59	19.424	0.269	0.0576	0.0009	0.0512	0.0007	321.7	4.4
18.1	277	204	0.74	11.8	0.000245	0.49	20.174	0.461	0.0565	0.0010	0.0493	0.0011	310.4	7.0
19.1	418	194	0.46	17.8	0.000162	0.26	20.140	0.255	0.0547	0.0008	0.0495	0.0006	311.6	3.9
20.1	413	221	0.53	17.7	0.000238	0.36	20.035	0.202	0.0555	0.0009	0.0497	0.0005	312.9	3.1
21.1	273	164	0.60	12.0	0.000429	0.41	19.568	0.254	0.0561	0.0010	0.0509	0.0007	320.0	4.1

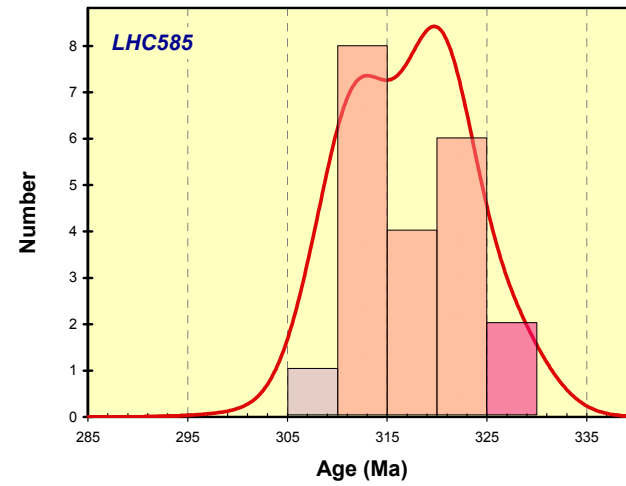
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 0.83% and 0.71% for the two analytical sessions (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
most	316.5	2.2	4.1
“older”	322.0	2	4.0
“younger”	313.0	2	4.0

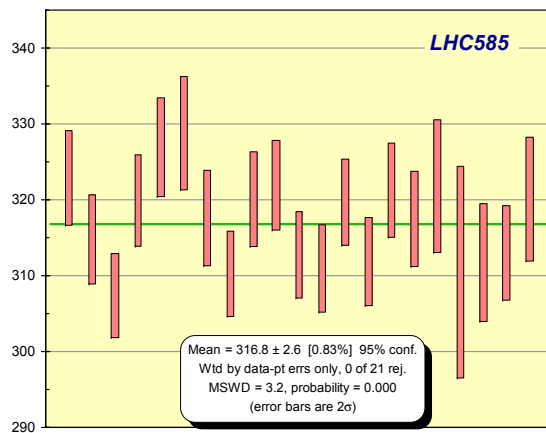
Figure 29. Plots of SHRIMP U-Pb zircon data for sample LHC585



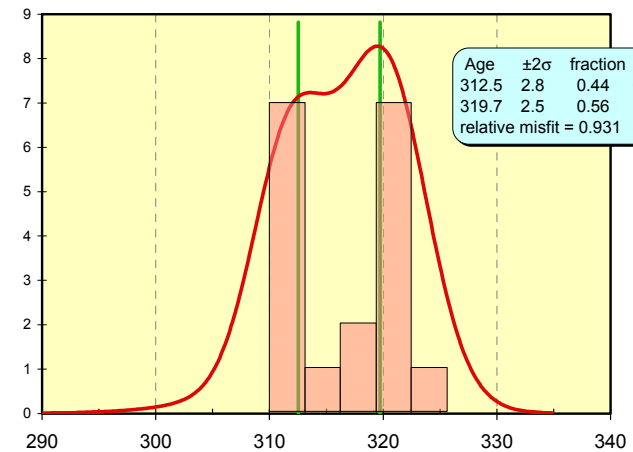
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains

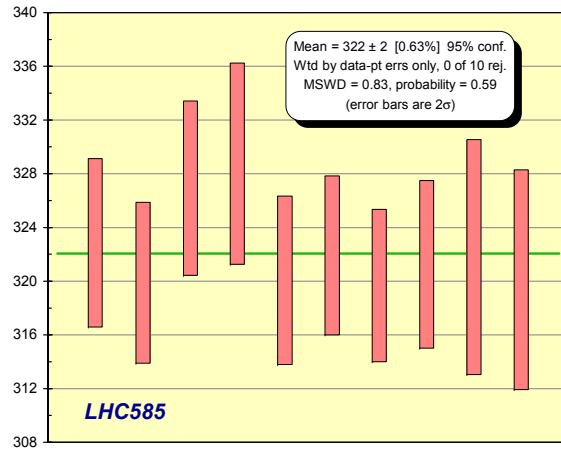


(c) Weighted average – all grains

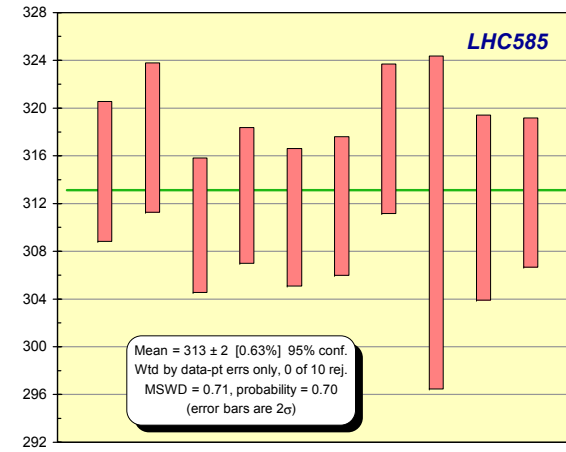


(d) Probability density plot unmixed

Figure 29 (continued). Plots of SHRIMP U-Pb zircon data for sample LHC585



(e) Weighted average – older group



(f) Weighted average – younger group

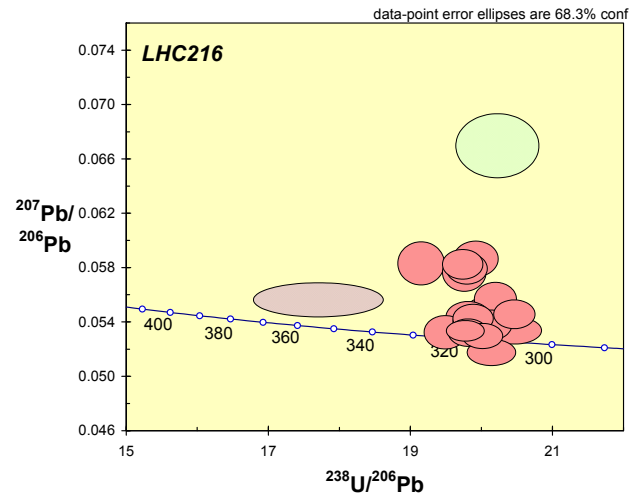
Table 30. Summary of SHRIMP U-Pb zircon analytical data for sample LHC216
 Sambo Granite: biotite granite. North of Spring Valley, CONNORS RANGE, MGA 746955 7555350

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	371	323	0.87	15.6	0.000010	0.10	20.468	0.253	0.0533	0.0007	0.0488	0.0006	307.2	3.7
2.1	257	180	0.70	11.1	-	0.20	19.817	0.205	0.0543	0.0008	0.0504	0.0005	316.7	3.2
3.1	292	179	0.61	12.3	0.000106	0.25	20.467	0.194	0.0545	0.0007	0.0487	0.0005	306.8	2.9
4.1	350	228	0.65	15.0	-	0.03	20.018	0.185	0.0529	0.0006	0.0499	0.0005	314.1	2.9
5.1	215	129	0.60	9.1	-	0.38	20.203	0.198	0.0556	0.0008	0.0493	0.0005	310.3	3.0
6.1	257	137	0.53	11.1	0.000057	0.11	19.947	0.221	0.0536	0.0007	0.0501	0.0006	315.0	3.4
7.1	231	141	0.61	10.0	0.000107	0.15	19.890	0.191	0.0539	0.0008	0.0502	0.0005	315.7	3.0
8.1	191	110	0.58	8.2	0.000512	0.24	20.071	0.205	0.0545	0.0008	0.0497	0.0005	312.7	3.2
9.1	212	119	0.56	9.1	0.000101	0.11	20.116	0.194	0.0535	0.0011	0.0497	0.0005	312.4	3.0
10.1	305	244	0.80	13.0	-	<0.01	20.145	0.222	0.0517	0.0006	0.0497	0.0006	312.7	3.4
11.1	252	146	0.58	10.7	0.000054	0.14	20.138	0.192	0.0537	0.0007	0.0496	0.0005	312.0	2.9
11.2	175	95	0.54	7.5	0.002712	1.81	20.230	0.385	0.0670	0.0016	0.0485	0.0009	305.5	5.8
12.1	276	167	0.61	11.9	0.000066	0.05	19.816	0.185	0.0531	0.0007	0.0504	0.0005	317.2	2.9
13.1	347	131	0.38	16.8	0.000422	0.25	17.711	0.602	0.0556	0.0008	0.0563	0.0019	353.2	11.8
14.1	237	157	0.66	10.3	-	0.06	19.875	0.236	0.0532	0.0007	0.0503	0.0006	316.3	3.7
15.1	185	105	0.57	8.2	0.000095	0.04	19.496	0.196	0.0532	0.0008	0.0513	0.0005	322.3	3.2
16.1	464	340	0.73	20.1	0.000001	0.07	19.775	0.175	0.0533	0.0005	0.0505	0.0005	317.8	2.8
17.1	240	140	0.58	10.4	0.000192	0.19	19.887	0.187	0.0542	0.0007	0.0502	0.0005	315.7	2.9
18.1	378	277	0.73	16.4	0.000404	0.61	19.762	0.205	0.0576	0.0009	0.0503	0.0005	316.3	3.2
18.2	615	482	0.78	26.8	0.000105	0.68	19.739	0.189	0.0582	0.0007	0.0503	0.0005	316.5	3.0
19.1	420	259	0.62	18.1	0.000771	0.74	19.927	0.208	0.0586	0.0009	0.0498	0.0005	313.4	3.2
20.1	240	139	0.58	10.8	0.000826	0.67	19.152	0.218	0.0583	0.0011	0.0519	0.0006	326.0	3.7
21.1	594	449	0.76	25.8	0.000405	0.65	19.800	0.188	0.0579	0.0007	0.0502	0.0005	315.6	3.0

- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 0.83% and 0.71% for the two analytical sessions (not included in above errors but required when comparing data from different mounts).
 3. f_{206} % denotes the percentage of ^{206}Pb that is common Pb.
 4. Correction for common Pb made using the measured $^{238}\text{U}/^{206}\text{Pb}$ and $^{207}\text{Pb}/^{206}\text{Pb}$ ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

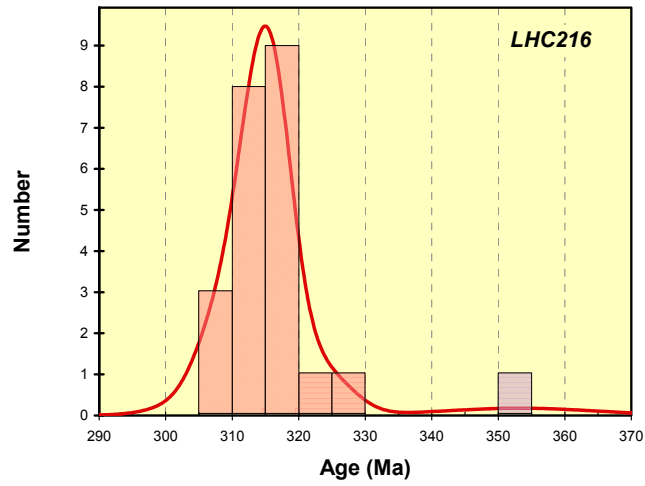
	Age	\pm no std	\pm include std
all	314.3	1.7	3.8
culled best fit	314.8	1.5	3.8

Figure 30. Plots of SHRIMP U-Pb zircon data for sample LHC216

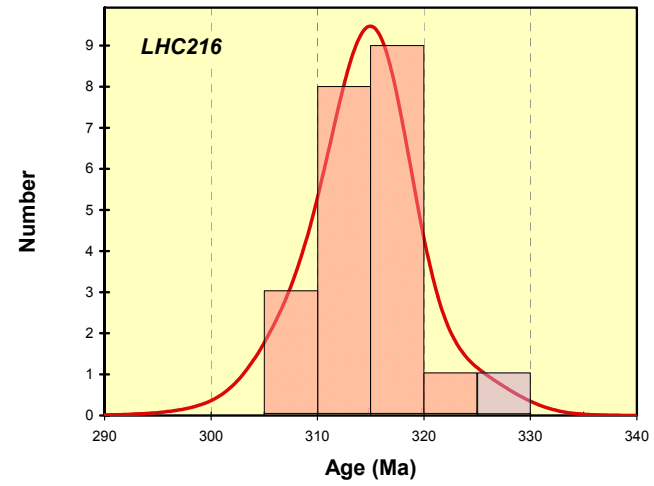


(a) Tera-Wasserburg plot, all analyses

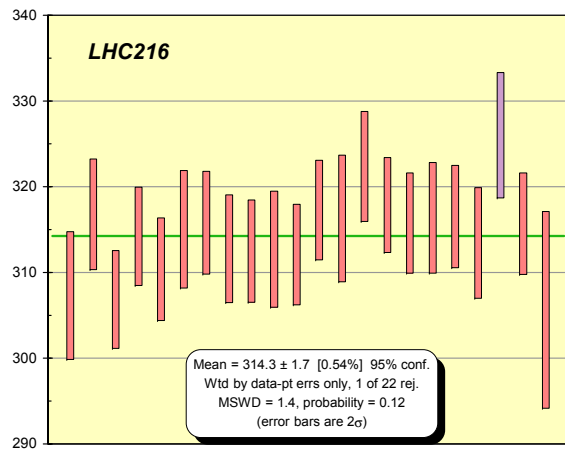
Figure 30 (continued). Plots of SHRIMP U-Pb zircon data for sample LHC216



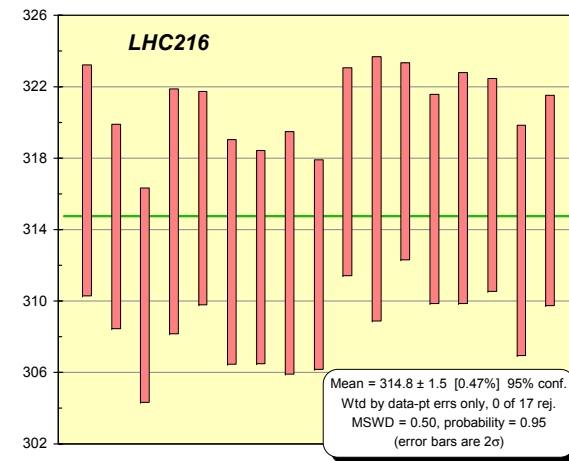
(b) Probability density plot – all grains



(c) Probability density plot – magmatic grains



(e) Weighted average – older group



(f) Weighted average – younger group

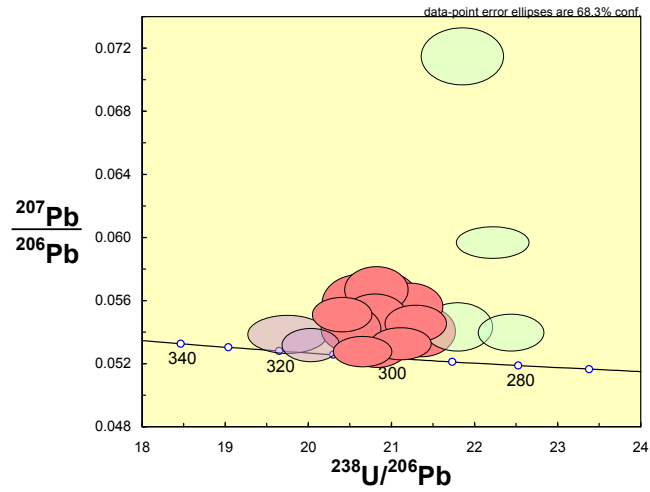
Table 31. Summary of SHRIMP U-Pb zircon analytical data for sample LHC882
Doreen Granite: hornblende-biotite quartz monzonite. Marble Tree Creek, near Doreen, CONNORS RANGE, MGA 717374 7546350

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
2.1	306	200	0.66	12.0	0.001341	2.44	21.850	0.328	0.0715	0.0012	0.0447	0.0007	281.6	4.3
2.2	390	203	0.52	16.1	0.000190	0.33	20.794	0.255	0.0550	0.0009	0.0479	0.0006	301.8	3.7
3.1	233	127	0.55	9.4	0.000635	0.23	21.353	0.273	0.0540	0.0011	0.0467	0.0006	294.4	3.7
3.2	172	79	0.46	7.2	0.000207	0.41	20.585	0.289	0.0557	0.0012	0.0484	0.0007	304.6	4.2
4.1	729	594	0.82	28.2	0.000309	0.97	22.211	0.291	0.0597	0.0007	0.0446	0.0006	281.2	3.7
5.1	415	234	0.56	16.8	0.000149	0.29	21.283	0.249	0.0545	0.0008	0.0469	0.0006	295.2	3.4
6.1	272	214	0.78	11.2	0.000044	0.54	20.813	0.255	0.0567	0.0010	0.0478	0.0006	300.9	3.7
7.1	130	49	0.37	5.4	0.001186	0.19	20.826	0.300	0.0539	0.0014	0.0479	0.0007	301.8	4.3
8.1	239	129	0.54	9.7	0.000208	0.42	21.216	0.266	0.0556	0.0010	0.0469	0.0006	295.7	3.7
9.1	338	237	0.70	14.2	-	0.32	20.395	0.239	0.0551	0.0007	0.0489	0.0006	307.6	3.6
7.2	143	110	0.77	5.9	0.000230	0.39	20.915	0.283	0.0554	0.0012	0.0476	0.0007	299.9	4.0
10.1	143	74	0.51	5.9	0.000153	0.49	20.797	0.326	0.0563	0.0011	0.0478	0.0008	301.3	4.7
11.1	416	206	0.50	17.3	-	0.04	20.645	0.233	0.0528	0.0006	0.0484	0.0006	304.8	3.4
12.1	285	220	0.77	11.9	0.000060	0.21	20.503	0.239	0.0542	0.0010	0.0487	0.0006	306.4	3.5
13.1	289	162	0.56	12.4	-	0.06	20.022	0.231	0.0532	0.0007	0.0499	0.0006	314.0	3.6
14.1	199	144	0.72	8.7	-	0.13	19.743	0.317	0.0538	0.0008	0.0506	0.0008	318.1	5.0
15.1	252	136	0.54	9.7	-	0.26	22.433	0.264	0.0540	0.0008	0.0445	0.0005	280.4	3.3
16.1	309	202	0.65	12.6	0.000198	0.12	21.102	0.242	0.0533	0.0007	0.0473	0.0005	298.1	3.4

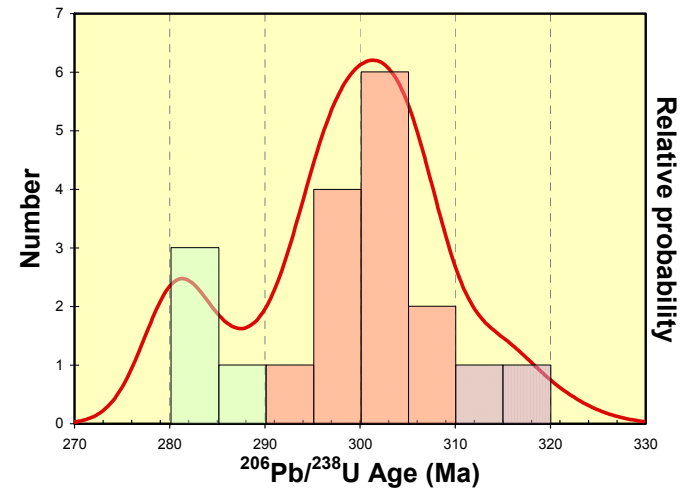
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.68% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age **± no std** **± include std**
300.9 **2.7** **3.4**

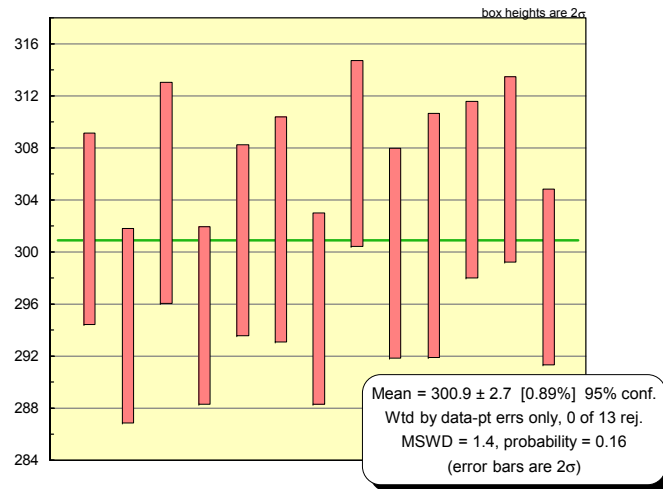
Figure 31. Plots of SHRIMP U-Pb zircon data for sample LHC882



(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – most grains

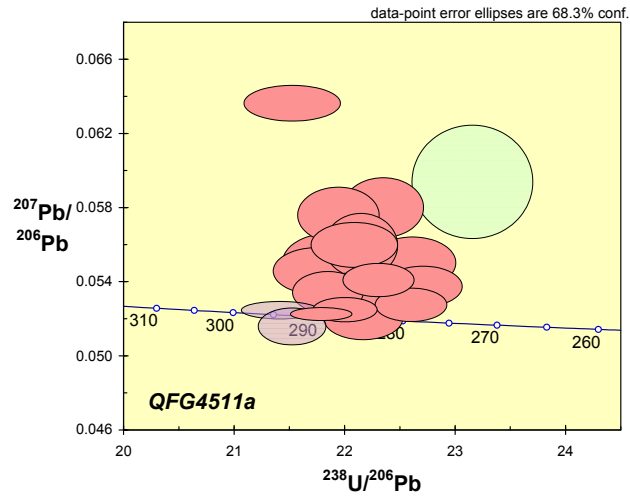
Table 32. Summary of SHRIMP U-Pb zircon analytical data for sample QFG4511A
Whitehorse Granite: biotite granite. Whitehorse Mountains, MIRANI, MGA 696563 7621504

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	1073	635	0.59	42.8	0.000941	1.44	21.524	0.287	0.0637	0.0006	0.0458	0.0006	288.6	3.8
2.1	716	2301	3.22	27.9	0.000584	0.16	22.047	0.223	0.0533	0.0008	0.0453	0.0005	285.5	2.9
3.1	366	1050	2.87	14.1	0.000477	0.76	22.351	0.242	0.0580	0.0011	0.0444	0.0005	280.0	3.0
4.1	1056	2266	2.15	40.1	0.000150	0.11	22.603	0.215	0.0527	0.0006	0.0442	0.0004	278.8	2.6
5.1	413	1023	2.48	15.7	0.000716	0.40	22.618	0.258	0.0550	0.0009	0.0440	0.0005	277.8	3.1
6.1	896	707	0.79	34.9	0.000284	0.50	22.091	0.260	0.0560	0.0008	0.0450	0.0005	284.0	3.3
7.1	6359	1961	0.31	250.7	0.000067	0.02	21.791	0.183	0.0522	0.0002	0.0459	0.0004	289.2	2.4
8.1	1565	427	0.27	60.3	0.000267	0.27	22.309	0.213	0.0541	0.0006	0.0447	0.0004	281.9	2.7
9.1	537	709	1.32	20.8	0.000205	0.50	22.150	0.218	0.0559	0.0011	0.0449	0.0005	283.3	2.8
10.1	257	567	2.21	9.5	0.000694	0.97	23.159	0.360	0.0594	0.0020	0.0428	0.0007	269.9	4.2
11.1	615	761	1.24	24.2	0.000455	0.17	21.851	0.212	0.0534	0.0007	0.0457	0.0004	288.0	2.8
12.1	756	508	0.67	29.3	0.000323	0.00	22.169	0.236	0.0520	0.0008	0.0451	0.0005	284.4	3.0
13.1	344	571	1.66	13.5	0.001098	0.38	21.886	0.294	0.0551	0.0010	0.0455	0.0006	287.0	3.8
14.1	493	1265	2.56	19.5	0.000185	0.31	21.754	0.265	0.0545	0.0008	0.0458	0.0006	288.8	3.5
15.1	3580	2138	0.60	143.6	0.000042	0.03	21.415	0.232	0.0524	0.0003	0.0467	0.0005	294.1	3.1
16.1	747	516	0.69	29.8	0.000225	<0.01	21.525	0.203	0.0515	0.0007	0.0465	0.0004	293.0	2.7
17.1	465	766	1.65	18.2	0.000444	0.70	21.944	0.245	0.0576	0.0010	0.0453	0.0005	285.3	3.2
18.1	639	1492	2.33	24.2	0.000023	0.24	22.711	0.236	0.0537	0.0007	0.0439	0.0005	277.1	2.8
19.1	1812	1114	0.62	70.7	0.000101	0.05	22.008	0.192	0.0525	0.0004	0.0454	0.0004	286.3	2.5

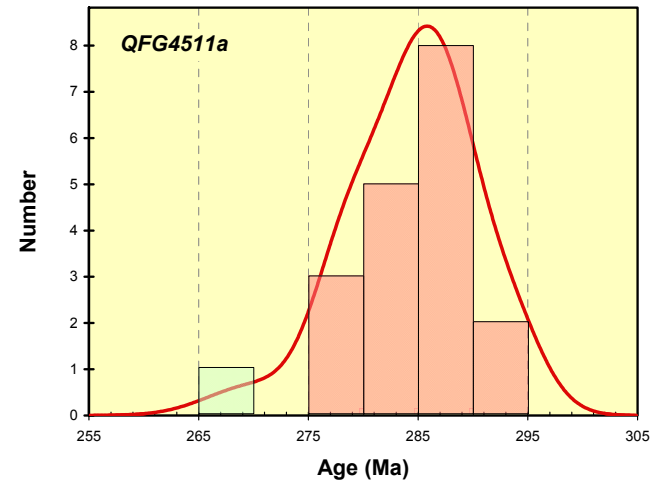
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 0.83% & 0.71% for the two analytical sessions (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

“magmatic” **Age** **± no std** **± include std**
285.0 **2** **3.7**

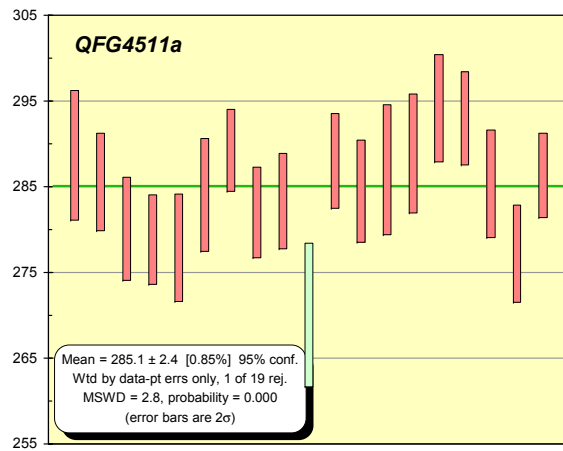
Figure 32. Plots of SHRIMP U-Pb zircon data for sample QFG4511A



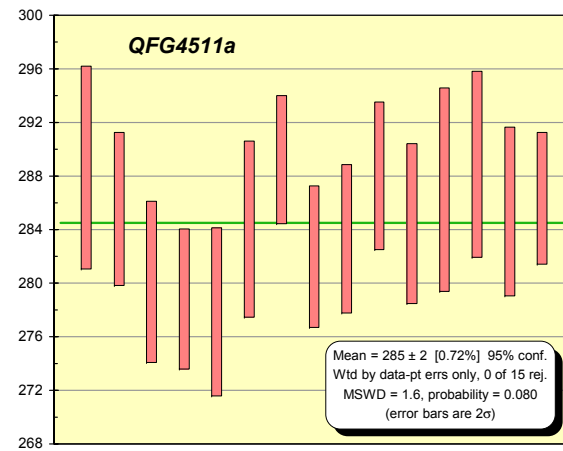
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

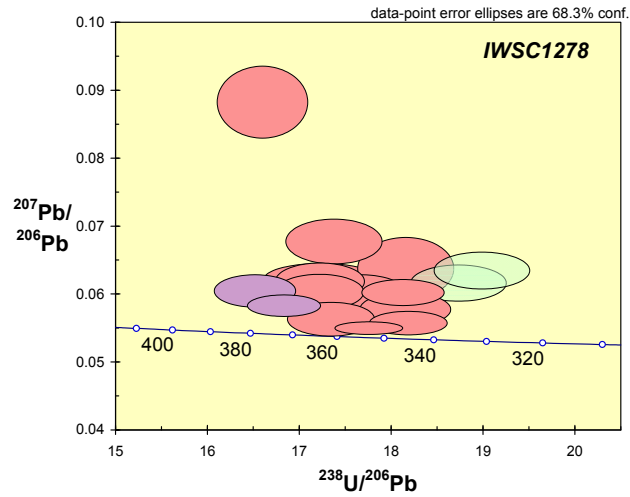
Table 33. Summary of SHRIMP U-Pb zircon analytical data for sample IWSC1278
Charon Point Rhyolite Member: crystal-rich rhyolite ignimbrite. South of Charon Point, SAINT LAWRENCE, MGA 789510 7520771

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	120	61	0.51	5.7	-	0.28	18.191	0.279	0.0556	0.0011	0.0548	0.0009	344.0	5.2
2.1	361	428	1.18	17.5	-	0.17	17.761	0.245	0.0549	0.0006	0.0562	0.0008	352.5	4.8
3.1	<i>analysis not completed</i>													
4.1	129	76	0.59	6.7	0.000281	0.78	16.521	0.293	0.0604	0.0016	0.0601	0.0011	376.0	6.6
5.1	115	63	0.55	5.3	0.000941	1.05	18.740	0.343	0.0615	0.0018	0.0528	0.0010	331.7	6.0
6.1	268	259	0.96	13.7	0.000486	0.53	16.837	0.262	0.0582	0.0010	0.0591	0.0009	370.0	5.7
7.1	126	65	0.52	6.2	-	0.31	17.350	0.312	0.0562	0.0016	0.0575	0.0011	360.2	6.4
8.1	91	44	0.48	4.7	0.001618	4.29	16.604	0.323	0.0883	0.0035	0.0576	0.0012	361.3	7.1
9.1	119	60	0.50	5.6	0.000786	0.54	18.155	0.326	0.0577	0.0016	0.0548	0.0010	343.8	6.1
10.1	109	48	0.45	5.4	0.001341	0.80	17.222	0.317	0.0602	0.0017	0.0576	0.0011	361.0	6.6
11.1	104	52	0.50	4.9	0.000579	1.30	18.160	0.346	0.0637	0.0030	0.0544	0.0011	341.2	6.5
12.1	206	114	0.55	9.8	0.001169	0.85	18.133	0.297	0.0601	0.0013	0.0547	0.0009	343.2	5.6
13.1	104	53	0.51	5.2	0.000569	1.00	17.226	0.318	0.0618	0.0018	0.0575	0.0011	360.2	6.6
14.1	189	92	0.49	9.1	0.000665	0.48	17.977	0.414	0.0573	0.0016	0.0554	0.0013	347.4	7.9
15.1	108	55	0.51	5.2	0.001227	0.82	17.670	0.325	0.0601	0.0017	0.0561	0.0011	352.1	6.4
16.1	86	45	0.52	4.2	0.001196	1.75	17.380	0.344	0.0677	0.0022	0.0565	0.0011	354.5	7.0
17.1	145	86	0.60	7.2	0.000070	1.04	17.242	0.410	0.0621	0.0015	0.0574	0.0014	359.8	8.4
18.1	132	66	0.50	6.0	0.000602	1.30	18.990	0.342	0.0634	0.0018	0.0520	0.0010	326.6	5.8

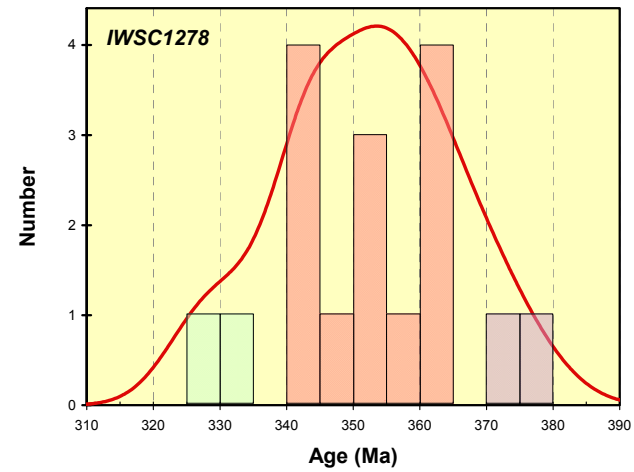
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 0.45% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

culled best fit **Age** **± no std** **± include std**
 351.5 4.6 4.9

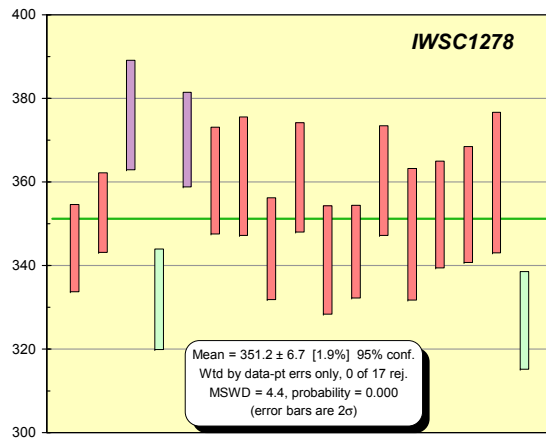
Figure 33. Plots of SHRIMP U-Pb zircon data for sample IWSC1278



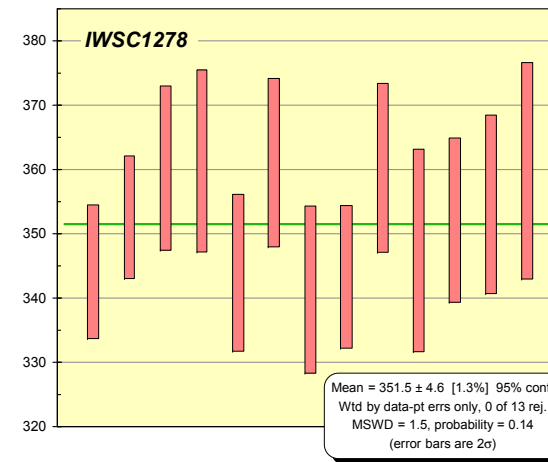
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – dominant group

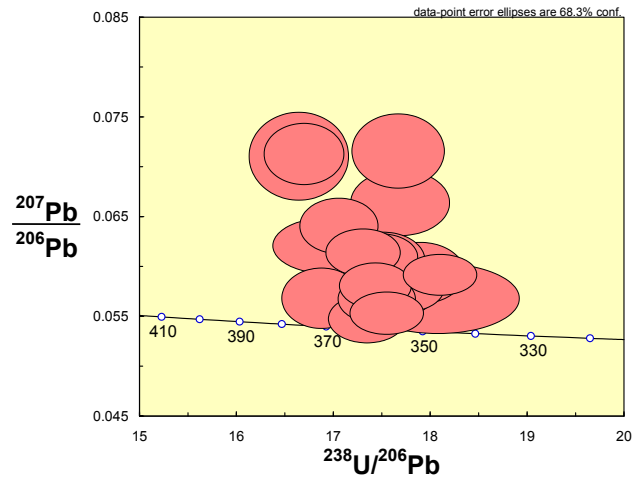
Table 34. Summary of SHRIMP U-Pb zircon analytical data for sample MHROYCB
 Rockhampton Group (below basal Youlambie Conglomerate): ignimbrite, Cania area

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	87	41	0.47	4.1	0.000588	0.42	18.073	0.555	0.0568	0.0023	0.0551	0.0017	345.8	10.5
2.1	157	82	0.53	7.7	0.000499	0.38	17.443	0.262	0.0567	0.0016	0.0571	0.0009	358.1	5.3
3.1	109	48	0.44	5.3	0.000890	0.52	17.618	0.294	0.0578	0.0020	0.0565	0.0010	354.1	5.9
4.1	125	58	0.46	6.4	0.000020	0.35	16.874	0.269	0.0568	0.0020	0.0591	0.0010	369.9	5.9
5.1	178	95	0.53	8.9	0.000123	0.95	17.303	0.252	0.0614	0.0016	0.0572	0.0009	358.8	5.2
6.1	166	82	0.50	8.2	0.000866	0.91	17.481	0.256	0.0609	0.0015	0.0567	0.0008	355.4	5.2
7.1	149	73	0.49	7.4	0.000993	0.12	17.343	0.263	0.0547	0.0016	0.0576	0.0009	360.9	5.4
8.1	162	70	0.43	8.0	-	0.72	17.382	0.272	0.0595	0.0041	0.0571	0.0010	358.1	5.8
9.1	256	136	0.53	12.2	0.000579	0.72	18.097	0.249	0.0591	0.0014	0.0549	0.0008	344.3	4.7
10.1	59	22	0.38	3.0	0.001523	2.12	16.640	0.341	0.0710	0.0029	0.0588	0.0012	368.5	7.6
11.1	135	68	0.51	6.8	-	1.27	17.052	0.268	0.0640	0.0018	0.0579	0.0009	362.8	5.7
12.1	122	53	0.43	6.0	0.001367	0.86	17.511	0.284	0.0606	0.0019	0.0566	0.0009	355.0	5.7
13.1	97	45	0.46	4.7	0.000221	2.25	17.662	0.315	0.0716	0.0025	0.0553	0.0010	347.2	6.3
14.1	133	84	0.63	6.8	0.000478	2.15	16.693	0.272	0.0713	0.0020	0.0586	0.0010	367.2	6.0
15.1	124	52	0.42	6.0	0.000086	0.73	17.892	0.303	0.0593	0.0020	0.0555	0.0010	348.1	5.9
16.1	124	60	0.49	6.3	-	1.01	16.917	0.360	0.0621	0.0018	0.0585	0.0013	366.6	7.7
17.1	118	52	0.44	5.7	0.001065	1.60	17.687	0.337	0.0664	0.0022	0.0556	0.0011	349.0	6.6
18.1	140	69	0.49	6.8	0.000101	0.54	17.738	0.266	0.0579	0.0016	0.0561	0.0009	351.7	5.2
19.1	174	86	0.49	8.6	0.001075	0.55	17.429	0.245	0.0581	0.0015	0.0571	0.0008	357.7	5.0
20.1	158	69	0.44	7.8	0.000582	0.20	17.547	0.249	0.0553	0.0014	0.0569	0.0008	356.6	5.0

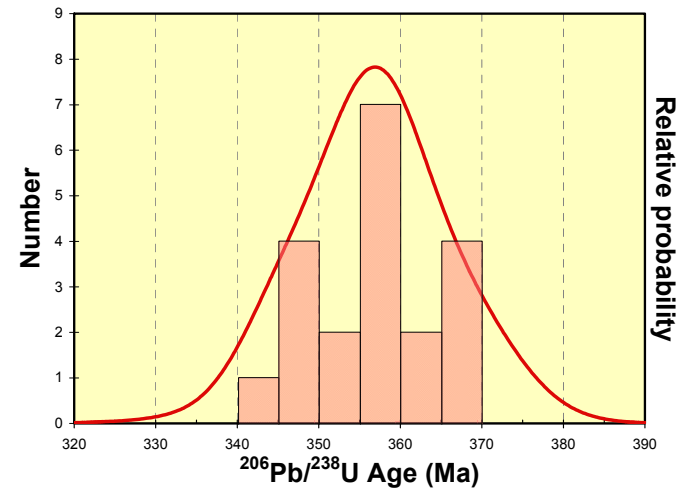
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.75% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age ± no std ± include std
 356.8 2.7 3.8

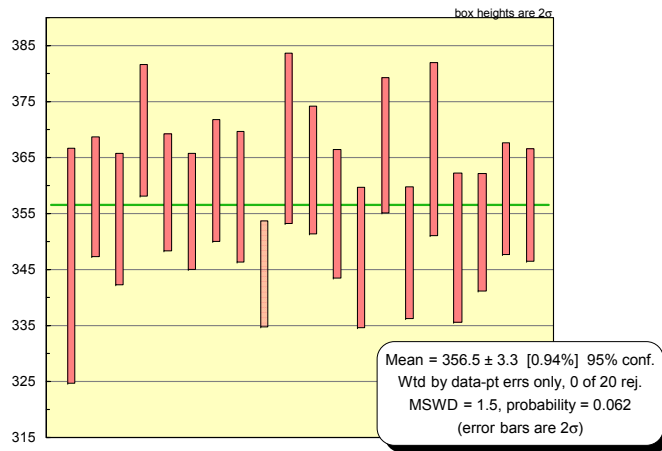
Figure 34. Plots of SHRIMP U-Pb zircon data for sample MHROYCB



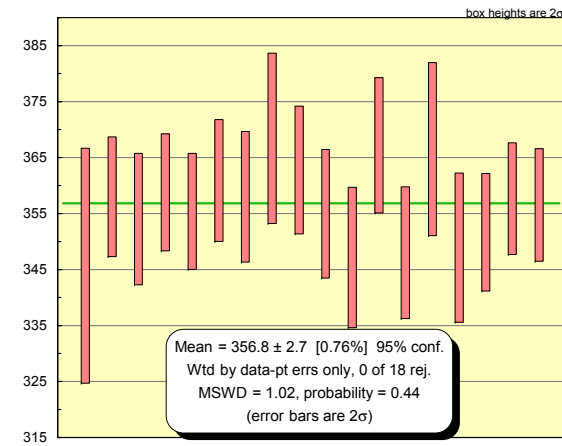
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

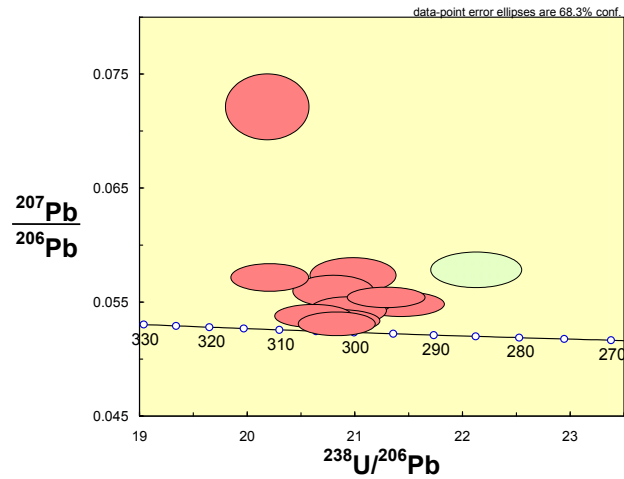
Table 35. Summary of SHRIMP U-Pb zircon analytical data for sample MHRO970C
 Youlambie Conglomerate: rhyolitic ignimbrite. Road cutting on Dawson Highway, 25km north-east of Biloela, BILOELA, MGA 262661 7319645

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	372	239	0.64	15.2	0.000289	0.33	20.956	0.252	0.0550	0.0008	0.0476	0.0006	299.5	3.6
2.1	585	644	1.10	24.0	0.000165	0.24	20.930	0.237	0.0542	0.0008	0.0477	0.0005	300.2	3.4
3.1	754	353	0.47	30.4	0.000306	0.40	21.287	0.239	0.0554	0.0006	0.0468	0.0005	294.8	3.3
4.1	329	212	0.64	12.8	0.000551	0.73	22.123	0.279	0.0578	0.0010	0.0449	0.0006	283.0	3.5
5.1	279	203	0.73	11.4	0.000472	0.63	20.978	0.264	0.0574	0.0010	0.0474	0.0006	298.3	3.7
6.1	615	292	0.47	25.6	0.000206	0.17	20.609	0.237	0.0538	0.0007	0.0484	0.0006	304.9	3.5
7.1	600	324	0.54	23.8	0.000134	0.33	21.419	0.268	0.0548	0.0007	0.0465	0.0006	293.2	3.6
8.1	459	257	0.56	19.5	0.000588	0.57	20.201	0.238	0.0572	0.0008	0.0492	0.0006	309.7	3.6
9.1	613	304	0.50	25.3	-	0.12	20.867	0.238	0.0533	0.0006	0.0479	0.0006	301.4	3.4
10.1	324	179	0.55	13.4	0.000288	0.45	20.797	0.248	0.0560	0.0009	0.0479	0.0006	301.4	3.6
11.1	477	240	0.50	20.3	0.001687	2.45	20.181	0.256	0.0721	0.0019	0.0483	0.0006	304.3	4.0
12.1	528	240	0.45	21.8	0.000081	0.09	20.826	0.236	0.0531	0.0007	0.0480	0.0005	302.1	3.4

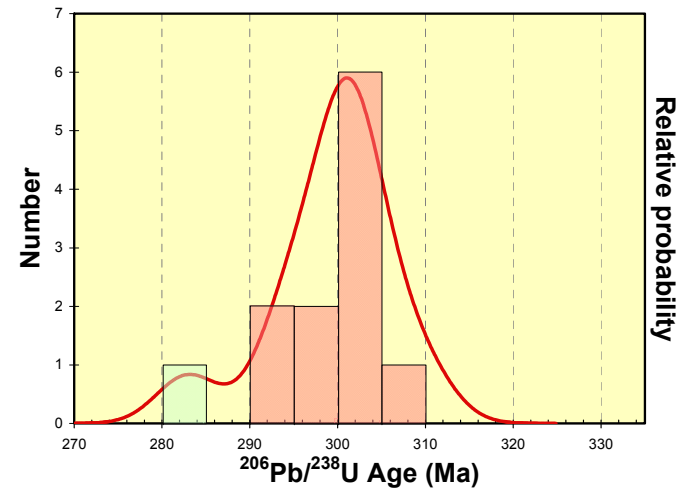
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.48% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

	Age	± no std	± include std
most	300.8	3.1	3.4
with rejects	300.6	2.3	2.7

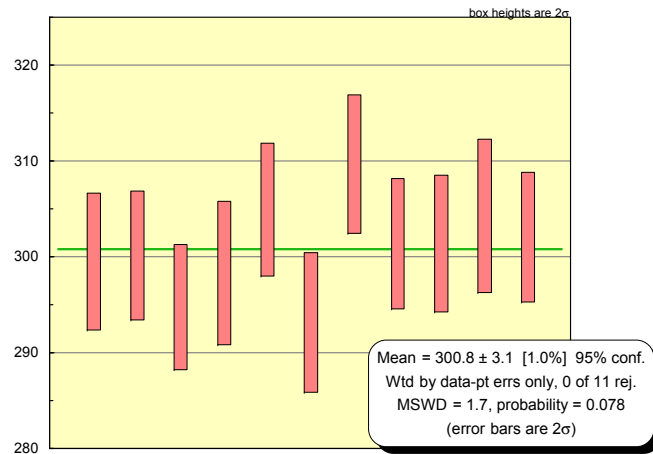
Figure 35. Plots of SHRIMP U-Pb zircon data for sample MHRO970C



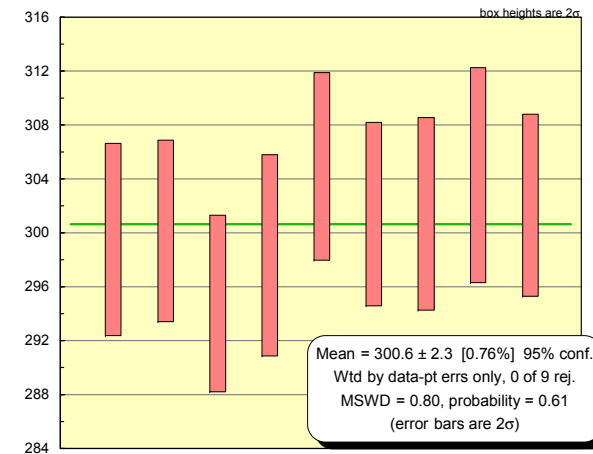
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

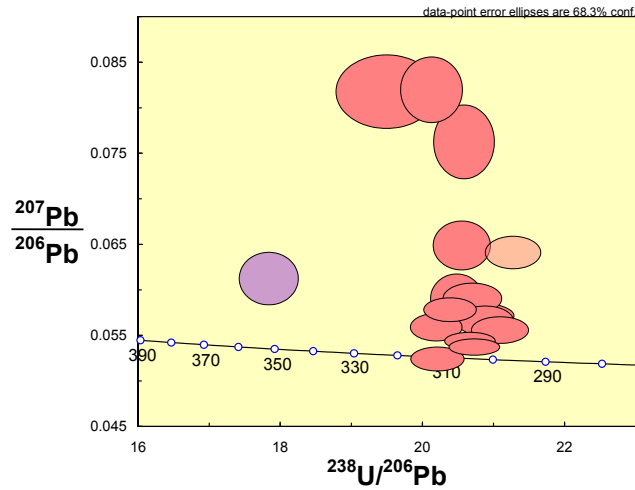
Table 36. Summary of SHRIMP U-Pb zircon analytical data for sample MHRO971(1)
 Youlambie Conglomerate: rhyolitic ignimbrite. Road cutting on Dawson Highway, 22km north-east of Biloela, BILOELA, MGA 258242 7318366

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	341	182	0.53	14.1	0.000681	0.83	20.700	0.272	0.0590	0.0011	0.0479	0.0006	301.7	3.9
2.1	450	273	0.61	18.6	0.000101	0.59	20.774	0.338	0.0571	0.0009	0.0479	0.0008	301.3	4.9
3.1	667	487	0.73	26.9	0.001004	1.49	21.270	0.259	0.0641	0.0012	0.0463	0.0006	291.9	3.6
4.1	469	228	0.49	19.3	0.000243	0.53	20.882	0.262	0.0566	0.0011	0.0476	0.0006	300.0	3.7
5.1	327	170	0.52	13.7	0.001744	2.98	20.579	0.280	0.0762	0.0027	0.0471	0.0007	297.0	4.3
6.1	868	339	0.39	36.4	0.000681	0.82	20.480	0.241	0.0590	0.0018	0.0484	0.0006	304.9	3.6
7.1	91	62	0.69	4.0	0.001809	3.63	19.490	0.471	0.0818	0.0027	0.0494	0.0012	311.1	7.6
8.1	374	194	0.52	16.0	0.001946	3.68	20.123	0.287	0.0819	0.0024	0.0479	0.0007	301.4	4.6
9.1	581	285	0.49	24.5	0.000625	0.66	20.382	0.244	0.0578	0.0009	0.0487	0.0006	306.8	3.6
10.1	735	693	0.94	31.3	0.000071	0.41	20.189	0.238	0.0559	0.0010	0.0493	0.0006	310.4	3.6
11.1	336	161	0.48	14.1	0.000188	1.55	20.548	0.266	0.0649	0.0018	0.0479	0.0006	301.7	3.9
12.1	1057	453	0.43	50.9	-	0.97	17.830	0.275	0.0613	0.0019	0.0555	0.0009	348.5	5.4
13.1	735	330	0.45	30.5	0.000081	0.16	20.727	0.234	0.0537	0.0006	0.0482	0.0005	303.3	3.4
14.1	269	141	0.52	10.9	0.000698	0.41	21.085	0.266	0.0556	0.0010	0.0472	0.0006	297.5	3.7
15.1	624	283	0.45	25.9	0.000002	0.25	20.664	0.234	0.0544	0.0006	0.0483	0.0006	303.9	3.4
16.1	303	182	0.60	12.9	0.000360	<0.01	20.205	0.247	0.0524	0.0009	0.0495	0.0006	311.5	3.8

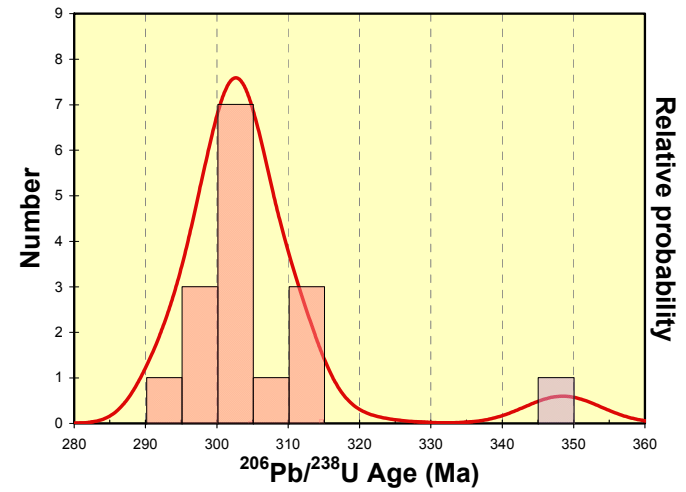
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.71% & 0.48% for the two analytical sessions (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age **± no std** **± include std**
303.6 **2.6** **3.7**

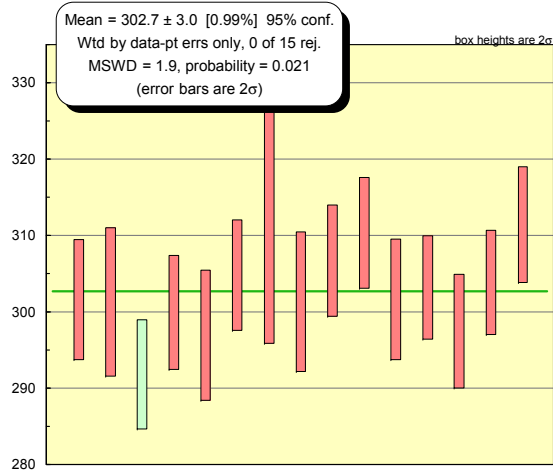
Figure 36. Plots of SHRIMP U-Pb zircon data for sample MHRO971(1)



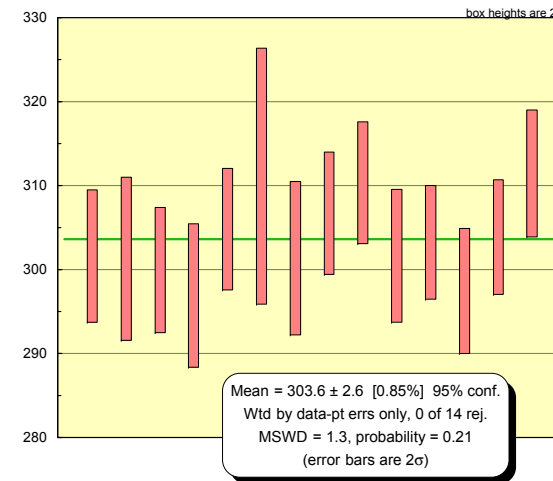
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – most grains



(d) Weighted average – best estimate

Table 37. Summary of SHRIMP U-Pb zircon analytical data for sample MHRO971(2)

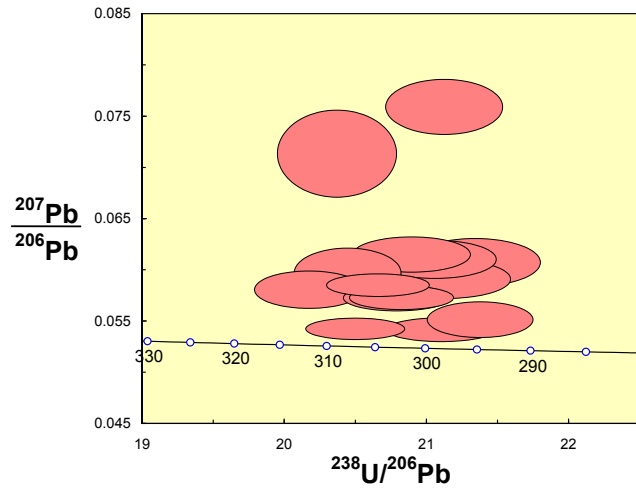
Youlambie Conglomerate: rhyolitic ignimbrite. Road cutting on Dawson Highway, 22km northeast of Biloela, BILOELA, MGA 258242 7318366

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	675	247	0.37	28.0	0.000289	0.61	20.821	0.243	0.0572	0.0008	0.0477	0.0006	300.6	3.5
2.1	382	267	0.70	15.5	0.002189	2.96	21.123	0.273	0.0759	0.0018	0.0459	0.0006	289.5	3.9
3.1	350	118	0.34	14.2	0.000985	0.85	21.130	0.304	0.0591	0.0013	0.0469	0.0007	295.6	4.2
4.1	358	168	0.47	14.6	0.001462	1.09	21.056	0.286	0.0610	0.0012	0.0470	0.0007	295.9	4.0
5.1	420	264	0.63	17.3	0.001083	1.15	20.894	0.274	0.0615	0.0011	0.0473	0.0006	298.0	3.9
6.1	654	300	0.46	27.5	0.000728	0.90	20.443	0.248	0.0597	0.0016	0.0485	0.0006	305.2	3.7
7.1	521	335	0.64	22.2	0.000386	0.68	20.170	0.254	0.0580	0.0012	0.0492	0.0006	309.9	3.9
8.1	249	169	0.68	10.0	0.000380	1.07	21.341	0.304	0.0607	0.0015	0.0464	0.0007	292.1	4.2
9.1	279	207	0.74	11.8	0.000492	2.36	20.367	0.277	0.0713	0.0028	0.0479	0.0007	301.9	4.3
10.1	783	336	0.43	32.5	-	0.76	20.657	0.238	0.0585	0.0007	0.0480	0.0006	302.5	3.5
11.1	371	43	0.12	71.7	0.000005	4.77	4.440	0.053	0.1227	0.0018	0.2145	0.0031	1252.5	16.3
12.1	609	433	0.71	25.2	-	0.61	20.787	0.246	0.0572	0.0008	0.0478	0.0006	301.1	3.5
13.1	403	230	0.57	16.4	0.000031	0.23	21.101	0.254	0.0541	0.0008	0.0473	0.0006	297.8	3.6
14.1	513	302	0.59	20.6	0.000511	0.37	21.376	0.246	0.0551	0.0012	0.0466	0.0005	293.7	3.4
15.1	660	249	0.38	27.7	0.000400	0.22	20.494	0.230	0.0542	0.0007	0.0487	0.0006	306.5	3.4

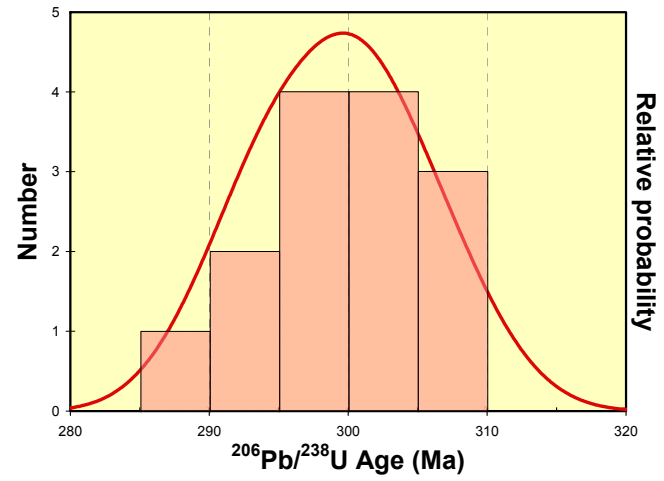
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.71% & 0.48% for the two analytical sessions (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age **± no std** **± include std**
300.0 **2.8** **3.8**

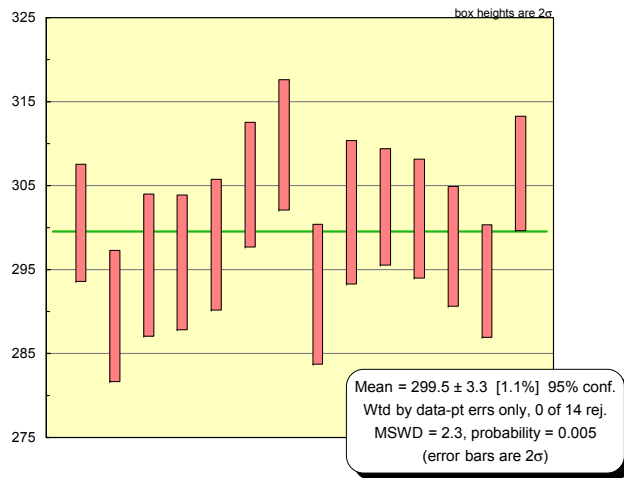
Figure 37. Plots of SHRIMP U-Pb zircon data for sample MHRO971(2)



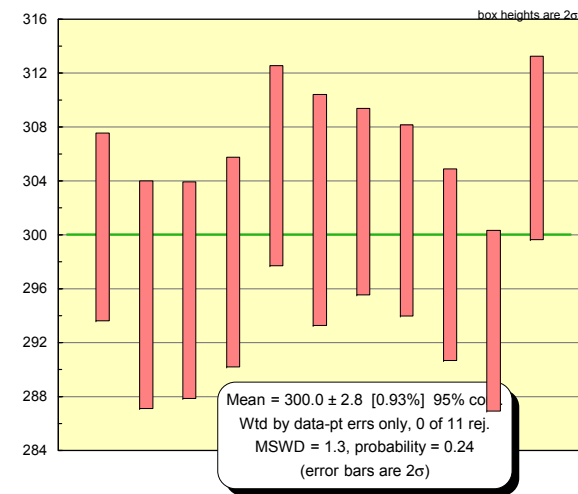
(a) Tera-Wasserburg plot, magmatic grains



(b) Probability density plot – all grains



(c) Weighted average – magmatic grains



(d) Weighted average – best estimate

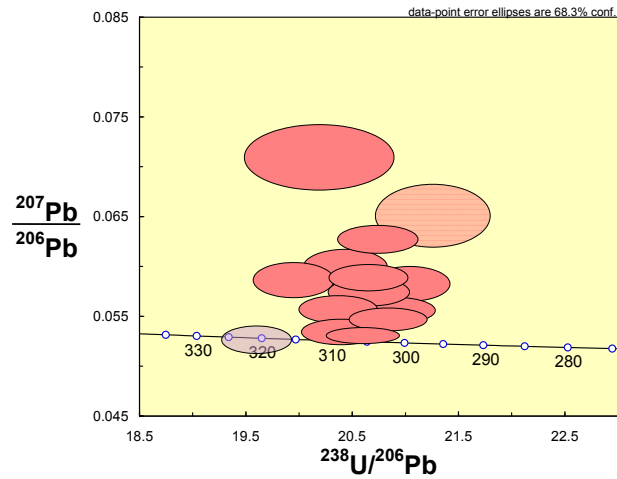
Table 38. Summary of SHRIMP U-Pb zircon analytical data for sample MHRO971(3)
 Youlambie Conglomerate: rhyolitic ignimbrite. Road cutting on Dawson Highway, 22km north-east of Biloela, BILOELA, MGA 258242 7318366

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	404	167	0.41	16.3	0.000354	1.61	21.253	0.356	0.0651	0.0021	0.0463	0.0008	291.7	4.9
2.1	651	363	0.56	26.8	0.000406	0.40	20.885	0.259	0.0556	0.0009	0.0477	0.0006	300.3	3.7
3.1	497	301	0.60	21.4	0.000433	0.74	19.941	0.251	0.0586	0.0012	0.0498	0.0006	313.1	3.9
4.1	678	357	0.53	28.6	0.000453	0.39	20.362	0.244	0.0557	0.0009	0.0489	0.0006	307.9	3.7
5.1	146	110	0.75	6.2	0.002596	2.30	20.185	0.464	0.0709	0.0022	0.0484	0.0011	304.7	7.0
6.1	491	278	0.57	20.4	0.000354	0.62	20.650	0.251	0.0574	0.0009	0.0481	0.0006	303.0	3.7
7.1	743	295	0.40	30.6	-	0.29	20.832	0.241	0.0547	0.0007	0.0479	0.0006	301.4	3.4
8.1	571	212	0.37	23.3	0.000148	0.74	21.037	0.250	0.0582	0.0012	0.0472	0.0006	297.2	3.5
9.1	313	230	0.73	13.2	0.000073	0.93	20.431	0.262	0.0599	0.0012	0.0485	0.0006	305.2	3.9
10.1	546	275	0.50	22.7	0.000045	0.81	20.648	0.245	0.0589	0.0009	0.0480	0.0006	302.5	3.6
11.1	321	199	0.62	13.3	0.000411	1.29	20.738	0.249	0.0627	0.0009	0.0476	0.0006	299.8	3.6
12.1	814	342	0.42	33.9	0.000040	0.07	20.594	0.227	0.0531	0.0005	0.0485	0.0005	305.4	3.3
13.1	308	123	0.40	13.0	0.000347	0.11	20.389	0.246	0.0534	0.0008	0.0490	0.0006	308.3	3.7
14.1	835	346	0.41	36.6	0.000121	<0.01	19.590	0.216	0.0526	0.0009	0.0511	0.0006	321.0	3.5

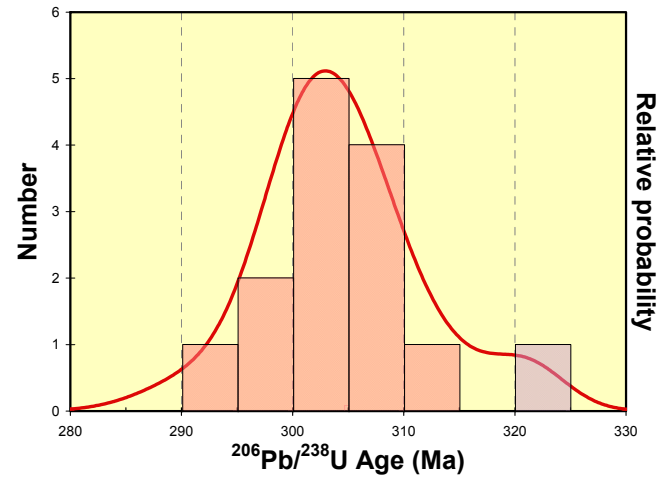
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.71% & 0.48% for the two analytical sessions (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age **± no std** **± include std**
303.1 **2.2** **3.4**

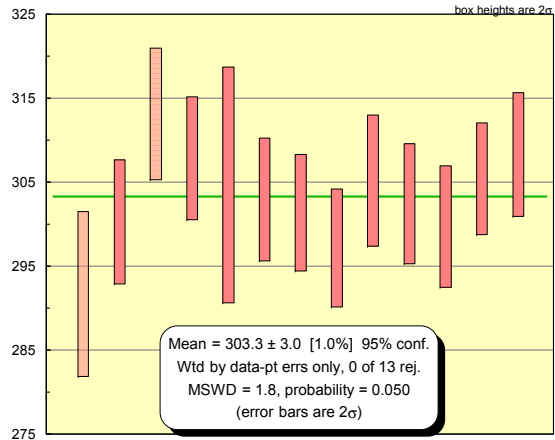
Figure 38. Plots of SHRIMP U-Pb zircon data for sample MHRO971(3)



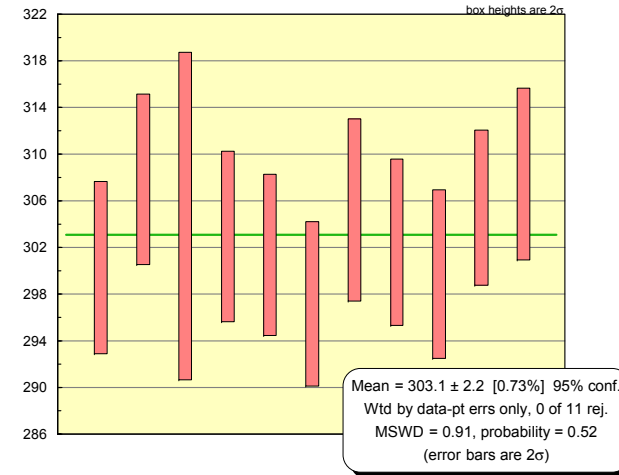
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

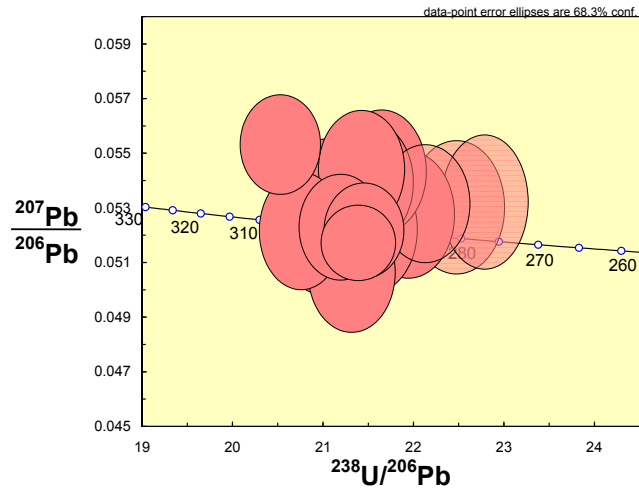
Table 39. Summary of SHRIMP U-Pb zircon analytical data for sample IWSC1304
 Glenprairie beds: feldspar-phyric rhyolitic ignimbrite. North-west of Bald Hills homestead, SAINT LAWRENCE, MGA 792384 7512373

Grain. spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	142	113	0.80	5.7	0.000394	0.01	21.538	0.330	0.0522	0.0015	0.0464	0.0007	292.6	4.5
2.1	167	134	0.81	6.5	0.000178	0.15	22.129	0.327	0.0532	0.0014	0.0451	0.0007	284.5	4.2
2.2	277	234	0.84	10.5	-	0.18	22.781	0.318	0.0532	0.0016	0.0438	0.0006	276.5	3.8
3.1	377	348	0.92	15.1	0.000218	<0.01	21.385	0.272	0.0517	0.0009	0.0468	0.0006	294.8	3.7
4.1	112	83	0.74	4.5	-	0.04	21.244	0.352	0.0526	0.0018	0.0471	0.0008	296.4	4.9
5.1	171	143	0.84	7.0	0.000417	<0.01	21.112	0.417	0.0518	0.0014	0.0474	0.0009	298.5	5.8
6.1	129	99	0.77	5.3	-	0.08	20.968	0.379	0.0530	0.0017	0.0477	0.0009	300.1	5.4
7.1	268	300	1.12	10.7	0.000436	<0.01	21.447	0.291	0.0522	0.0011	0.0466	0.0006	293.8	4.0
8.1	163	179	1.10	6.5	0.000272	0.27	21.640	0.326	0.0543	0.0015	0.0461	0.0007	290.4	4.4
9.1	145	105	0.72	5.9	0.000992	0.11	21.059	0.330	0.0532	0.0016	0.0474	0.0008	298.8	4.6
10.1	160	128	0.80	6.3	0.000421	0.09	21.941	0.336	0.0527	0.0015	0.0455	0.0007	287.1	4.4
11.1	152	110	0.72	5.8	0.000342	0.14	22.473	0.352	0.0530	0.0016	0.0444	0.0007	280.3	4.4
12.1	171	153	0.90	6.9	-	<0.01	21.313	0.317	0.0506	0.0014	0.0470	0.0007	296.2	4.4
13.1	219	152	0.69	9.2	0.000259	0.35	20.521	0.293	0.0553	0.0012	0.0486	0.0007	305.7	4.3
14.1	195	230	1.18	7.9	-	<0.01	21.190	0.302	0.0523	0.0013	0.0472	0.0007	297.3	4.2
15.1	140	112	0.80	5.6	0.000376	0.22	21.502	0.325	0.0539	0.0015	0.0464	0.0007	292.4	4.4
16.1	166	178	1.07	6.9	-	<0.01	20.753	0.306	0.0521	0.0014	0.0482	0.0007	303.5	4.4
17.1	171	135	0.79	6.8	-	0.28	21.420	0.314	0.0544	0.0014	0.0466	0.0007	293.3	4.3

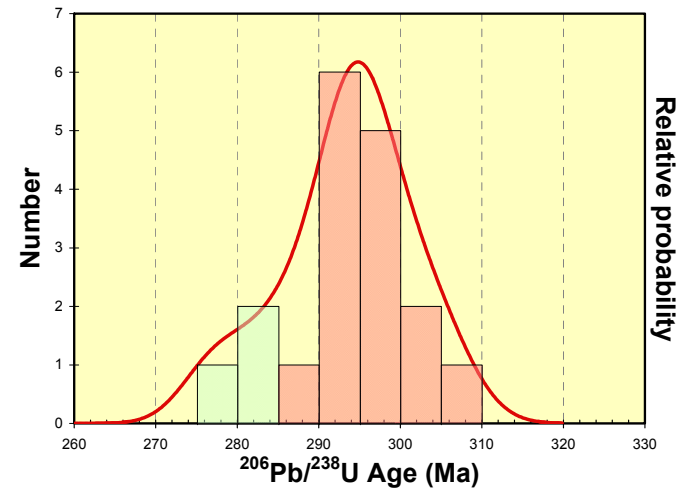
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.80% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age	± no std	± include std
294.3	2.7	3.6

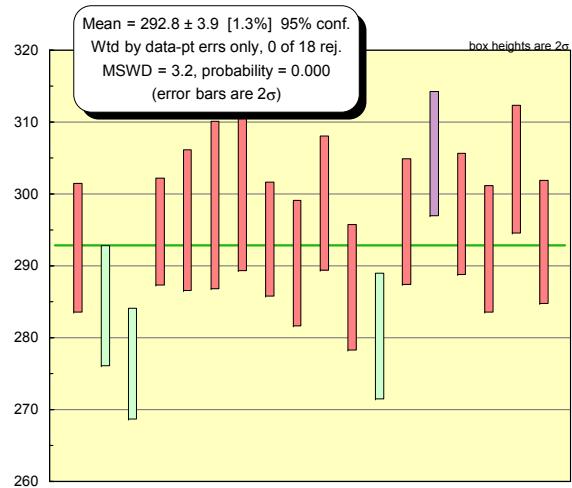
Figure 39. Plots of SHRIMP U-Pb zircon data for sample IWSC1304



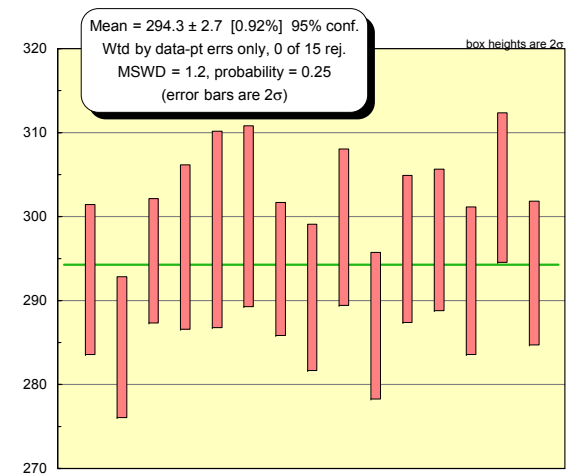
(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(c) Weighted average – all grains



(d) Weighted average – best estimate

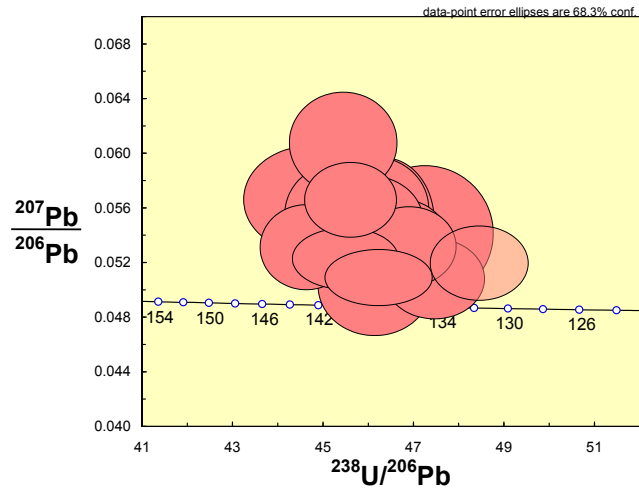
Table 40. Summary of SHRIMP U-Pb zircon analytical data for sample RSC026A
Whitsunday Volcanics (originally mapped as Campwyn Volcanics): rhyolitic ignimbrite. Slade Point, MACKAY, MGA 731000 7669000

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	56	48	0.86	1.0	-	0.68	47.245	0.992	0.0541	0.0033	0.0210	0.0005	134.1	2.9
2.1	137	174	1.27	2.5	0.000951	0.79	46.357	0.718	0.0550	0.0031	0.0214	0.0003	136.5	2.2
3.1	83	70	0.85	1.5	0.000131	0.19	46.136	0.826	0.0503	0.0024	0.0216	0.0004	138.0	2.5
4.1	83	98	1.18	1.5	0.002996	0.90	46.089	0.819	0.0560	0.0025	0.0215	0.0004	137.1	2.5
5.1	95	127	1.34	1.8	0.001922	0.78	46.050	0.767	0.0550	0.0022	0.0215	0.0004	137.4	2.3
6.1	94	95	1.01	1.8	0.003268	1.50	45.436	0.786	0.0608	0.0024	0.0217	0.0004	138.3	2.4
7.1	133	174	1.30	2.5	0.001765	0.98	45.605	0.672	0.0566	0.0018	0.0217	0.0003	138.5	2.1
8.1	66	61	0.94	1.2	0.001240	0.86	46.032	0.852	0.0557	0.0026	0.0215	0.0004	137.4	2.6
9.1	78	85	1.08	1.5	-	0.84	45.360	0.794	0.0555	0.0025	0.0219	0.0004	139.4	2.5
10.1	68	57	0.83	1.3	-	0.97	44.686	0.965	0.0566	0.0026	0.0222	0.0005	141.3	3.1
11.1	108	121	1.13	2.0	-	0.26	47.457	0.725	0.0508	0.0019	0.0210	0.0003	134.1	2.1
12.1	119	148	1.25	2.2	-	0.56	46.898	0.689	0.0532	0.0019	0.0212	0.0003	135.3	2.0
13.1	92	102	1.11	1.8	0.000297	0.53	44.613	0.678	0.0531	0.0021	0.0223	0.0003	142.1	2.2
14.1	75	73	0.96	1.4	0.000851	0.58	45.893	0.749	0.0534	0.0022	0.0217	0.0004	138.2	2.3
15.1	167	320	1.92	3.1	0.000143	0.27	46.226	0.781	0.0509	0.0014	0.0216	0.0004	137.6	2.3
16.1	97	89	0.91	1.8	0.000221	0.51	46.761	0.709	0.0528	0.0025	0.0213	0.0003	135.7	2.1
17.1	141	195	1.38	2.7	-	0.43	45.484	0.779	0.0523	0.0015	0.0219	0.0004	139.6	2.4
18.1	107	72	0.67	1.9	-	0.41	48.443	0.716	0.0520	0.0018	0.0206	0.0003	131.2	1.9

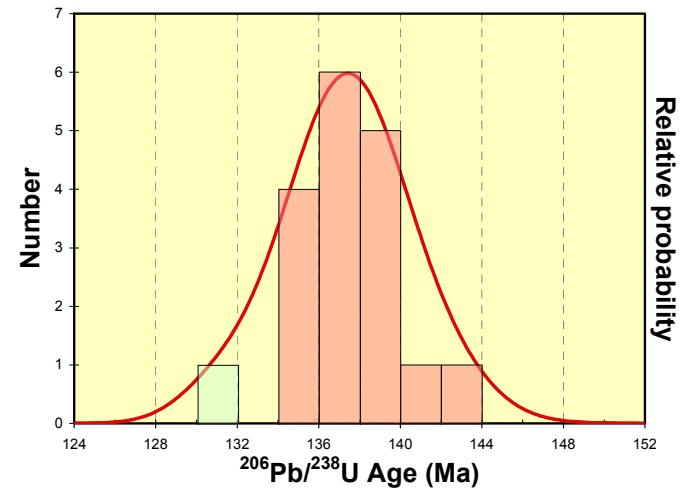
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in AS3 reference zircon calibration was 0.68% for the analytical session (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998).

Age ± no std ± include std
137.5 1.1 1.4

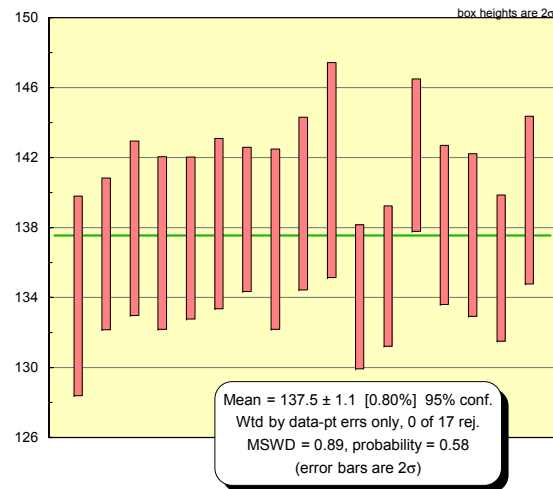
Figure 40. Plots of SHRIMP U-Pb zircon data for sample RSC026A



(a) Tera-Wasserburg plot, all analyses



(b) Probability density plot – all grains



(d) Weighted average – best estimate

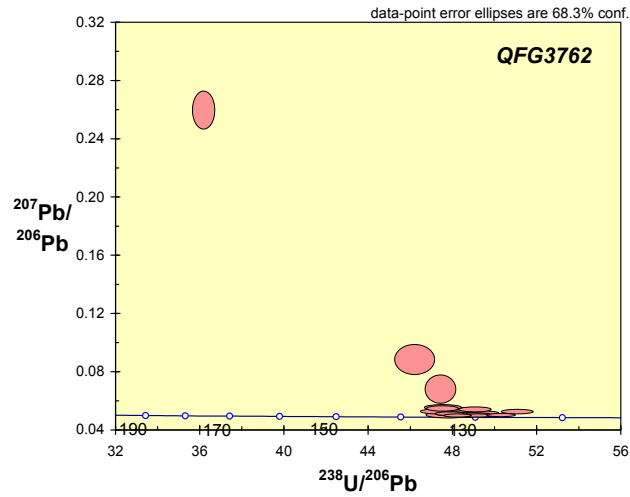
Table 41. Summary of SHRIMP U-Pb zircon analytical data for sample QFG3672
 Ben Mohr Igneous Complex: fine-grained hornblende-biotite granodiorite. North side of Ben Mohr, MACKAY, MGA 693960 7647840

Grain spot	U (ppm)	Th (ppm)	Th/U	²⁰⁶ Pb* (ppm)	²⁰⁴ Pb/ ²⁰⁶ Pb	f ₂₀₆ %	Total				Radiogenic		Age (Ma)	
							²³⁸ U/ ²⁰⁶ Pb	±	²⁰⁷ Pb/ ²⁰⁶ Pb	±	²⁰⁶ Pb/ ²³⁸ U	±	²⁰⁶ Pb/ ²³⁸ U	±
1.1	388	675	1.74	7.0	0.000077	0.20	47.884	0.455	0.0503	0.0008	0.0208	0.0002	133.0	1.3
2.1	303	394	1.30	5.3	0.000146	0.12	49.053	0.546	0.0495	0.0009	0.0204	0.0002	129.9	1.4
3.1	320	590	1.85	5.9	0.002416	4.92	46.230	0.633	0.0878	0.0068	0.0206	0.0003	131.2	2.1
4.1	624	1565	2.51	11.1	0.000275	0.05	48.264	0.439	0.0491	0.0007	0.0207	0.0002	132.1	1.2
5.1	239	315	1.31	4.2	-	0.26	49.163	0.698	0.0507	0.0011	0.0203	0.0003	129.5	1.8
6.1	253	342	1.35	4.6	0.002108	2.35	47.445	0.490	0.0674	0.0065	0.0206	0.0003	131.3	1.7
7.1	434	779	1.79	7.7	-	0.19	48.189	0.582	0.0502	0.0008	0.0207	0.0003	132.2	1.6
8.1	657	1323	2.01	11.2	0.000228	0.10	50.321	0.453	0.0494	0.0007	0.0199	0.0002	126.7	1.1
9.1	623	1450	2.33	11.0	0.000109	0.03	48.792	0.573	0.0489	0.0006	0.0205	0.0002	130.8	1.5
10.1	134	160	1.19	2.4	0.000254	0.10	47.821	0.702	0.0495	0.0014	0.0209	0.0003	133.3	2.0
11.1	508	1002	1.97	8.9	0.000456	0.06	49.202	0.478	0.0491	0.0007	0.0203	0.0002	129.6	1.3
12.1	313	409	1.31	5.3	0.000817	0.42	51.090	0.500	0.0519	0.0010	0.0195	0.0002	124.4	1.2
13.1	186	273	1.47	3.4	0.001033	0.66	47.540	0.504	0.0539	0.0012	0.0209	0.0002	133.3	1.4
14.1	326	449	1.37	5.8	0.000152	0.20	47.978	0.483	0.0503	0.0009	0.0208	0.0002	132.7	1.3
15.1	367	656	1.79	8.7	0.016906	26.59	36.200	0.350	0.2601	0.0087	0.0203	0.0004	129.4	2.4
16.1	561	1102	1.96	10.1	0.000613	0.75	47.558	0.578	0.0546	0.0013	0.0209	0.0003	133.2	1.6
17.1	598	887	1.48	10.6	0.000568	0.53	48.604	0.723	0.0529	0.0011	0.0205	0.0003	130.6	1.9
18.1	444	642	1.44	8.0	0.000979	0.52	47.596	0.540	0.0528	0.0013	0.0209	0.0002	133.3	1.5
19.1	839	1720	2.05	15.0	0.000426	0.37	47.979	0.524	0.0516	0.0009	0.0208	0.0002	132.5	1.4
20.1	658	1178	1.79	11.5	0.000214	0.58	49.092	0.511	0.0533	0.0011	0.0203	0.0002	129.2	1.3
21.1	523	745	1.43	9.5	0.000744	0.40	47.265	0.510	0.0519	0.0011	0.0211	0.0002	134.4	1.5

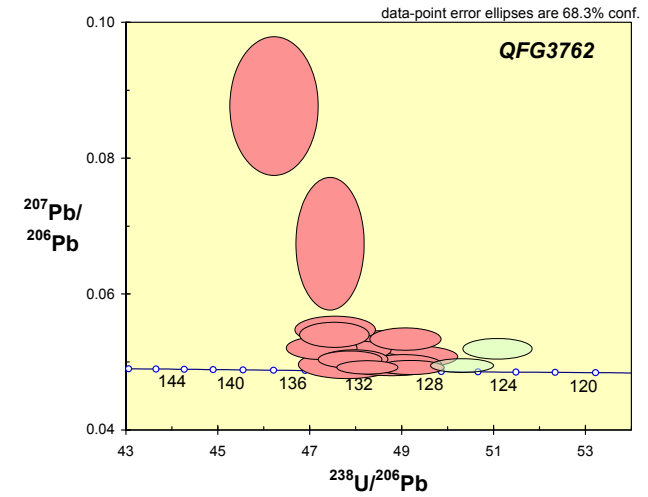
- Notes:
1. Uncertainties given at the one σ level.
 2. Error in FC1 Reference zircon calibration was 0.83% & 0.71% for the two analytical sessions (not included in above errors but required when comparing data from different mounts).
 3. f₂₀₆ % denotes the percentage of ²⁰⁶Pb that is common Pb.
 4. Correction for common Pb made using the measured ²³⁸U/²⁰⁶Pb and ²⁰⁷Pb/²⁰⁶Pb ratios following Tera & Wasserburg (1972) as outlined in Williams (1998)

	Age	± no std	± include std
“magmatic”	131.8	0.68	1.6

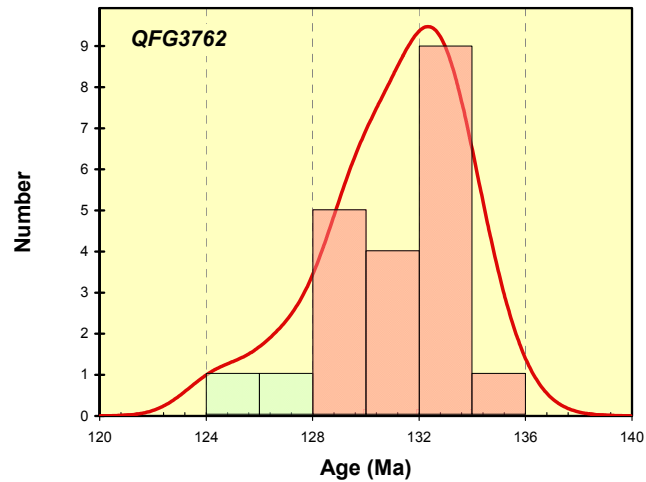
Figure 41. Plots of SHRIMP U-Pb zircon data for sample QFG3762



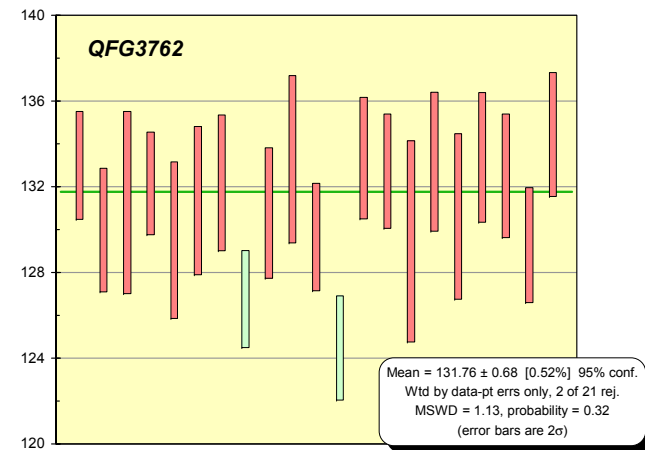
(a) Tera-Wasserburg plot, all analyses



(b) Tera-Wasserburg plot, most analyses



(c) Probability density plot – all grains



(d) Weighted average

Table 42. Summary of all ages (sorted by structural and geological units)

Sample	Structural Unit	Geological unit	Locality	Rock Type	Age
LHT540	Auburn Arch	Boam Creek Granodiorite	Road into Kandoona south-east of Mount Appenben 228115 7239385	Biotite hornblende granodiorite	315.3±4.0Ma for 9 of 12 analyses
BB2535	Auburn Arch	Camboon Volcanics	Bank of Delusion Ck 227131 7215636	Ignimbrite	Mean of 308.2±5Ma for 8 of 16 analyses; very messy population; unmixing of 13 analyses resolves into a dominant population at 309±4 Ma and a subordinate one at 295±6Ma
IWGG809	Auburn Arch	Camboon Volcanics	11km north of Rannes 206680 7342697	Crystal-rich rhyolitic ignimbrite	297.1±3.3Ma (early Permian) for 12 of 15 analyses (3 with radiogenic Pb loss)
QFG2722	Auburn Arch	Coonambula Granite	Target Ck, 9km west of Coonambula 284469 7177150	Deformed (gneissic) biotite granite	Two zircon populations at ~290Ma and ~320Ma Former may be crystallisation age
RSC164A	Auburn Arch	Donore Granite Gneiss	Eidsvold–Cracow road near St Johns Creek crossing 276831 7188285	Deformed (gneissic) granite	342.5±4.0Ma (Tournaisian–Visean) for 11 of 14 analyses
IRAU481	Auburn Arch	Evandale Tonalite	South bank of Auburn River north-east of Evandale 254700 7154700	Hornblende biotite tonalite	Excess scatter with MSWD ~3. Arbitrarily trimming data gives a mean age of 319±Ma.; unmixing suggests a complex population with a possible magmatic age of ~300Ma
RSC137	Auburn Arch	Glandore Granodiorite	Near Glandore homestead 24412 7248110	Hornblende-biotite	323.4±3.9Ma for 12 of 15 analyses (2 with Pb loss, 1 older)
IRAU613	Auburn Arch	Torsdale Volcanics	Mount Misery 231700 7135650	Rhyolitic ignimbrite	314.9±2.9Ma for 14 of 18 analyses (some Pb loss)
IWGN145	Auburn Arch	Torsdale Volcanics	Moura Railway, towards Banana Range 224328 7295987	Crystal-rich rhyolite ignimbrite	Dominant younger group of 16 analyses has a weighted mean ²⁰⁶ Pb/ ²³⁸ U age of 298.2±5.1Ma (MSWD = 0.98). An older group of 9 analyses have a weighted mean ²⁰⁶ Pb/ ²³⁸ U age of 315±5.8Ma (MSWD= 0.78)
LHT322	Auburn Arch	Torsdale Volcanics	South of Glandore homestead, adjacent to Glandore Granodiorite 238846 7244535	Recrystallised rhyolite	Dominant peak at 325±4.0Ma (Namurian) for 15 of 20 analyses (younger group indicate Pb loss?)
RSC157	Auburn Arch	Torsdale Volcanics	Eidsvold–Cracow road 234121 7198220	Rhyolitic ignimbrite	308±5.1Ma for 14 of 15 analyses (MSWD = 2.0)
RSC218A	Auburn Arch	Torsdale Volcanics	Cockatoo Creek near Taroom–Auburn road 234400 7153600	Rhyolitic ignimbrite	311.6±3.8Ma for 10 of 15 analyses (3 younger grains are suspect; 2 older grains)
IWSC0601	Connors Arch	Bora Creek Quartz Monzodiorite	Broadsound Range, 747231 7485675	Hornblende-biotite quartz monzodiorite	316.4±3.4 (10 analyses) with an older group at 329±5Ma (5 analyses) (3 with Pb loss)

Table 42 (continued)

Sample	Structural Unit	Geological unit	Locality	Rock Type	Age
IWSC0323	Connors Arch	Broadsound Range Volcanics	East of Mount Mackenzie 754791 7468649	Crystal-rich rhyolite ignimbrite	313.8±3.4Ma (MSWD =2.2) (15 analyses). 2 grains give inherited age of ~340Ma and ~330Ma
IWSC0669	Connors Arch	Broadsound Range Volcanics	South of Mount Larry, 751535 7482339	Slightly hornfelsed crystal-rich ignimbrite (intruded by Bora Creek Quartz Monzodiorite)	308.4±3.3Ma from dominant group 13 of 18 analyses. Problematic - slightly younger (outside error) than granite that is thought to intrude it
IWSC0733	Connors Arch	Burwood Complex	North of Burwood, 745201 7507469	Hornblende-biotite granodiorite	328.0±3.8Ma (16 of 20 analyses (3 older ones)
BB3050A	Connors Arch	Carmila beds	Near Koumala, 750671 7566261	Rhyodacite ignimbrite	Two groups 292.8±2.9Ma (10 analyses) and 305.4±3.4Ma (7 analyses)
RSC093	Connors Arch	Clive Creek Volcanics — Cycle 1	Old Bruce Hwy near Mount Mackenzie 749770 7470770	Crystal-rich, lithic-poor rhyolitic ignimbrite	348.9±4.8Ma (Tournaisian) for 11 of 15 analyses (2 older, 1 with Pb loss)
LHC585	Connors Arch	Dacey Granite	East of Dacey homestead, 734425 7544556	Hornblende-biotite granite	Probably two populations. 10 oldest grains produce a mean of 322±4Ma and are probably inherited (<i>cf</i> Hazlewood Granite). 10 youngest give 313±4.0Ma
LHC882	Connors Arch	Doreen Granite	Marble Tree Creek, near Doreen, 717374 7546350	Hornblende-biotite quartz monzonite	300.9±3.4Ma for 13 of 18 analyses (2 older, 4 with Pb loss)
LHC091	Connors Arch	Hazlewood Granite	South of Oaky Creek, south-east of Carmila, 750900 7560420	Biotite granite	Unmixing of the main group of 14 of 19 grains suggests a magmatic age of 314.9±4.0Ma with significant inherited components at 332.2±3.3 and 347±5.9Ma. Other inherited grains are ~385 and 407Ma
BB3399	Connors Arch	Leura Volcanics	East of Nebo Creek 674161 7610294	Crystal-rich dacitic ignimbrite	293.5±4.0Ma (17 of 23 analyses) 3 slightly older ~305Ma, 2 with Pb loss and 1 high in common Pb)
IWSC0897	Connors Arch	Leura Volcanics	East of Wahroonga homestead 734500 7508950	Crystal-rich ignimbrite	Two clear groupings. Older grouping (9 analyses) at 307.1±4.7Ma and younger group at 291.2±4.2Ma (12 analyses)
LHC878	Connors Arch	Leura Volcanics	Near Doreen, north of Iron Pot Mountain, 716942 7547925	Hornfelsed rhyolite (thought to be intruded by LHC882)	Possibly 2 groups or a single group at 292±3.7Ma (12 analyses) with 2 older and some with Pb loss. Problematic — younger than granite that is thought to intrude it
RSC011	Connors Arch	Lizzie Creek Volcanic Group	North of Eungella Dam 636475 7667820	Crystal-rich dacitic ignimbrite	284.7±4.4Ma for 12 of 14 analyses (2 with Pb loss and very low U < 60ppm)

Table 42 (continued)

Sample	Structural Unit	Geological unit	Locality	Rock Type	Age
RSC074A	Connors Arch	Lotus Creek Rhyolite	Big Codling Creek near Croydon – St Lawrence road 732290 7520075	Crystal-rich, lithic-poor rhyolitic ignimbrite	295.0±3.4Ma for 11 of 13 analyses (2 with Pb loss)
LHC216	Connors Arch	Sambo Granite	North of Spring Valley 746955 755350	Biotite granite	314.8±3.8Ma for 17 of 22 analyses. Another slightly older grain at 325Ma and another at 355Ma
IWSC0353	Connors Arch	Tartus Rhyolite Volcanics	Near UHF repeater, East of Mount Mackenzie 755952 7466936	Crystal-rich rhyolitic ignimbrite	Dispersion about a mean of 300.8±4.1Ma (MSWD 1.8) for 22 of 26 analyses; 3 younger analyses
LHC927	Connors Arch	Whelan Creek Volcanics	East of Dacey – Killarney road, south of Dacey 734147 7540576	Crystal-rich rhyolite ignimbrite	Two populations at 314.1±5.0Ma (8 analyses) and 317.7±5.6Ma (11 analyses); scatter about bimodal peak
QFG4511A	Connors Arch	White Horse Granite	White Horse Mountain Range 696563 7621504	Biotite granite	285.0±3.7Ma (15 of 19 analyses)
QFG2732	Rawbelle Batholith	Widbury Granite	South of Widbury homestead 293936 7183354	Biotite granite	290.4±4.9Ma (9 of 15 analyses)
QFG2591	Rawbelle Batholith	Wingfield Granite	Nogo River, near Old Rawbelle homestead 282768 7228923	Biotite granite	18 analyses give 251.1±3.6Ma (external error) (MSWD = 2.7)
QFG3672	Whitsunday Province	Ben Mohr Igneous Complex	North side of Ben Mohr 693960 7647840	Fine-grained hornblende-biotite granodiorite	131.8±1.6Ma for 19 of 21 analyses (MSWD 1.13)
RSC026A	Whitsunday Province	Whitsunday Volcanics (originally thought to be Campwyn beds)	Slade Point, Mackay 731000 7669000	Rhyolitic ignimbrite	137.5±1.4Ma for 17 of 18 analyses
IWSC1278	Yarrol Province	Charon Point Rhyolite Member	South of Charon Point 789510 7520771	Crystal-rich rhyolite ignimbrite	13 analyses give an age of 351.5±4.9Ma (MSWD = 1.5).
MHROYCB	Yarrol Province	Rockhampton Group (below basal Youlambie Conglomerate)	Cania area	Ignimbrite	356.8±3.8Ma 18 of 20 analyses
MHRO970C	Yarrol Province	Youlambie Conglomerate	Roadcut on Dawson Hwy, 25km north-east of Biloela 262661 7319645	Rhyolitic ignimbrite	300.8±3.4 Ma for 11 of 12 analyses (MSWD 1.7)

Table 42 (continued)

Sample	Structural Unit	Geological unit	Locality	Rock Type	Age
MHRO971	Yarrol Province	Youlambie Conglomerate	Roadcut on Dawson Hwy, 22km north-east of Biloela 258242 7318366	Rhyolitic ignimbrite	303.6±3.7Ma for 14 of 16 analyses
MHRO971	Yarrol Province	Youlambie Conglomerate	Roadcut on Dawson Hwy, 22km north-east of Biloela 258242 7318366	Rhyolitic ignimbrite	300.0±3.8Ma for 11 of 15 analyses
MHRO971	Yarrol Province	Youlambie Conglomerate	Roadcut on Dawson Hwy, 22km north-east of Biloela 258242 7318366	Rhyolitic ignimbrite	303.1±3.8Ma for 11 of 15 analyses
IWSC1304	Yarrol Province?	Glenprairie beds	North-west of Bald Hills homestead 792384 7512373	Feldspar-phyric rhyolitic ignimbrite	294.3±3.6Ma (15 of 18 analyses)

Other relevant SHRIMP ages:

Age on Carmila beds at Dumbleton rocks (Allen & others, 1998): 294.2±2.8Ma

Age of a dacite dyke in the Urannah Complex (Allen & others, 1998): 283.9±5.2Ma

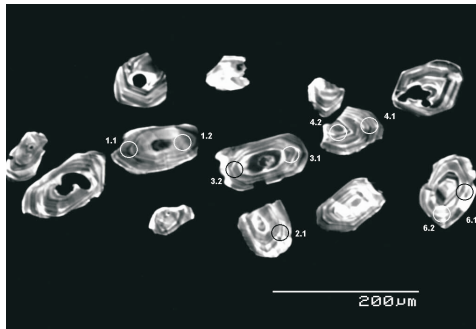
Ages by G. Burch (ANU Honours student)

Coppermine Tuff (andesitic lithic crystal tuff) 296±2.5Ma

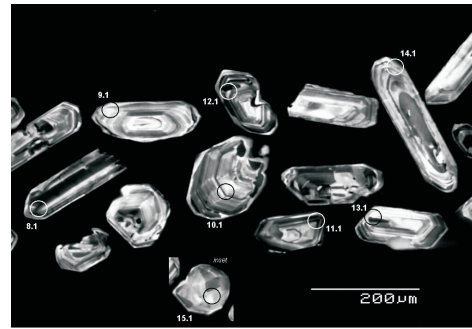
South Creek Diorite 304±4Ma

Macksford Volcanics (andesitic lithic tuff) 314.9±3.6Ma. This age is anomalous, given our younger ages on the Tartus Rhyolite and Leura Volcanics. It is based on 8 analyses on only 3 grains and given the andesitic composition, it is likely that these are inherited grains from Broadsound Volcanics or related plutonic basement.

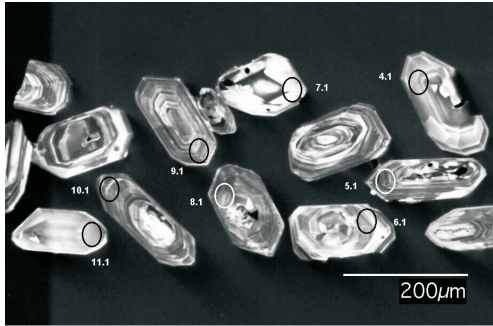
The dates by Burch may all be too old. Processing of data for the samples in this Appendix using the SQUID Excel Macro of Ludwig (2000) resulted in some ages being younger than originally determined. For example the preliminary age of ~303Ma referred to by Withnall & others (1997, 1998a,b) for the Lotus Creek Rhyolite was later determined to be 295±3.4Ma when reprocessed using the SQUID program.



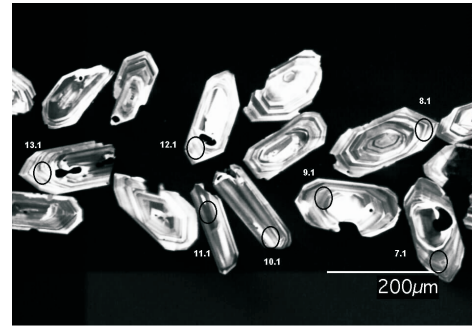
(a) IWGN145 Torsdale Volcanics



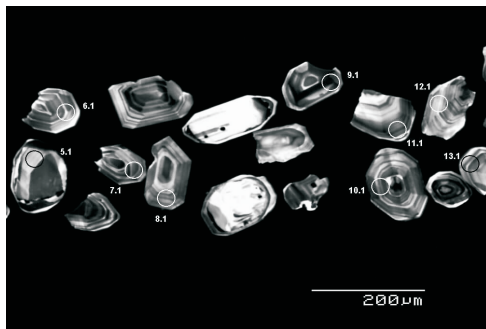
(b) QFG2732 Widbury Granodiorite



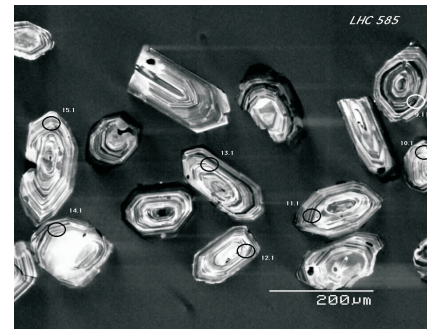
(c) QFG2591 Rawbelle Granite



(d) IWSC0323 Broadsound Range Volcanics



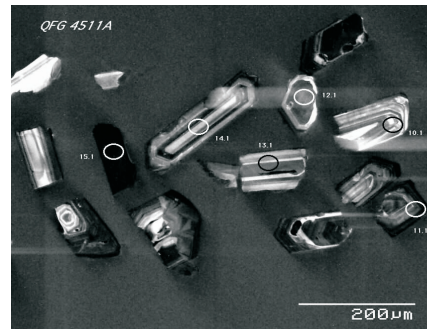
(e) LHC927 Whelan Creek Volcanics



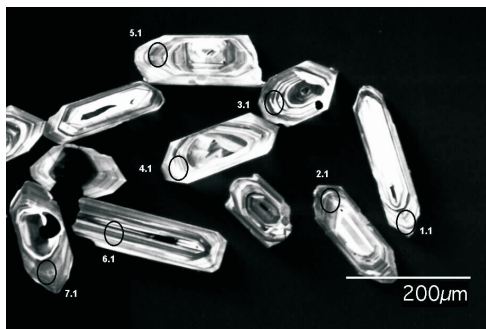
(g) LHC585 Dacey Granite



(g) LHC216 Sambo Granite



(h) QFG4511A Whitehorse Granite



(i) IWSC1278 Charon Point Rhyolite Member



(j) QFG3672 Ben Mohr Igneous Complex

Figure 42. Cathodoluminescence images of parts of selected zircon grain mounts

