Nevada Bureau of Mines and Geology Open-File Report 15-10

Analytical Data Accompanying "The Golden Devil Zone, a New Discovery in the Goldbanks District, Nevada" in *Geological Society of Nevada Symposium Proceedings* *May 18–21, 2015*

by
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2015

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APPENDIX 1: Geochronologic Methods and Results

This report serves as an analytical appendix for the new geochronological data presented and interpreted in "The Golden Devil Zone, a New Discovery in the Goldbanks District, Nevada" in *Geological Society of Nevada Symposium Proceedings May 18-21, 2015*. This appendix includes analytical data for all samples selected for U-Pb and $^{40}Ar/^{39}Ar$ analysis at the Kinross' Goldbanks project between 2012 and 2014, including samples where no age determination was possible.

Analyses for this study were done by the $^{40}Ar/^{39}Ar$ method at the Geophysical Institute, University of Alaska Fairbanks (http://www.gi.alaska.edu/facilities/geochronology-facility) and by the U-Pb method at the Arizona Laserchron Center, Department of Geosciences, University of Arizona (LA-ICPMS; Laser-ablation Inductively Coupled Plasma Mass Spectrometry; http://www.laserchron.org) and the Stanford/USGS SHRIMP-RG Lab at School of Earth, Energy and Environmental Sciences, Stanford University (SHRIMP-RG; Sensitive High-Resolution Ion Micro Probe – Reverse Geometry; https://shrimprg.stanford.edu/).

$^{40}Ar/^{39}Ar$ Methods

For $^{40}Ar/^{39}Ar$ analysis, five rock samples were submitted to the Geophysical Institute, Geochronology Laboratory at the University of Alaska Fairbanks (UAF) where they were crushed, sieved, washed and hand-picked for glass and adularia mineral phases (1000 microns to 150 microns). Aliquots of K-feldspar separates derived from mineral separation were analyzed using a Niton xl3t hand held X-ray fluorometer (XRF) to confirm mineral identification and purity.

The monitor mineral MMhb-1 (Samson and Alexander, 1987) with an accepted age of 513.9 Ma (Lanphere and Dalrymple, 2000) was used to monitor neutron flux (and calculate the irradiation parameter, J). The samples and standards were wrapped in aluminum foil and loaded into aluminum cans of 2.5 cm diameter and 6 cm height. The samples were irradiated in position 5c of the uranium enriched research reactor of McMaster University in Hamilton, Ontario, Canada for 20 megawatt-hours.

Upon their return from the reactor, the samples and monitors were loaded into 2 mm diameter holes in a copper tray that was then loaded in an ultra-high vacuum extraction line. The monitors were fused, and samples heated, using a 6-watt argon-ion laser following the technique described in York et al. (1981), Layer et al. (1987) and Benowitz et al., (2014). Argon purification was achieved using a liquid nitrogen cold trap and a SAES Zr-Al getter at 400C. The samples were analyzed in a VG-3600 mass spectrometer at the Geophysical Institute, University of Alaska Fairbanks. The argon isotopes measured were corrected for system blank and mass discrimination, as well as calcium, potassium and chlorine interference reactions following procedures outlined in McDougall and Harrison (1999). Typical full-system 8 min laser blank values (in moles) were generally 2×10^{-16} mol ^{40}Ar, 3 × 10218 mol ^{39}Ar, 9×10^{-18} mol ^{38}Ar and 2×10^{-18} mol ^{36}Ar, which are 10–50 times smaller than the sample/standard volume fractions. Correction factors for nucleogenic interferences during irradiation were determined from irradiated CaF2 and K2SO4 as follows: $(^{39}Ar/^{37}Ar)$ Ca = 7.06×10^{-4}, $(^{36}Ar/^{37}Ar)$ Ca = 2.79×10^{-4} and $(^{40}Ar/^{39}Ar)$ K = 0.0297. Mass discrimination was monitored by running calibrated air shots. The mass discrimination during these experiments was 1.3% per mass unit. While doing our experiments, calibration measurements were made on a weekly–monthly basis to check for changes in mass discrimination with no significant variation seen during these intervals.

After the publication of Ellis and Stroup (2015), the UAF Geochronology Laboratory recommended a modification to the accepted age for monitor mineral MMhb-1 (Samson and Alexander, 1987) to an accepted age of 523.5 Ma (Renne et al., 1994). A summary of all the original $^{40}Ar/^{39}Ar$ results, as cited in Ellis and Stroup (2015), is given in Table 1a. A summary of the revised ages, recalculated using an age of 523.5 Ma for monitor mineral MMhb-1, is given in Table 1b. All ages quoted to the ± 1 sigma level and calculated using the constants of Renne et al. (2010). The integrated age is the age given by the total gas measured and is equivalent to a potassium-argon (K-Ar) age. The spectrum provides a plateau age if three or more consecutive gas fractions represent at least 50% of the total gas release and are within two standard deviations of each other (Mean Square Weighted Deviation of less than 2.5). Isochron ages were calculated using an in-house program for selected samples if they had 3 or more consecutive fractions forming a linear array with a MSWD less than 2.5). For each step-heated sample, age, Ca/K and Cl/K spectra are shown in figures 1–3. The Ca/K and Cl/K spectra were determined from the interference and decay corrected and calibrated $^{37}Ar/^{39}Ar$ and $^{38}Ar/^{39}Ar$ ratios for each step.

Individual analyses and age spectra plots from each sample are included in this open-file report, attached as .csv and .pdf files.

Interpretive Details of $^{40}Ar/^{39}Ar$ Analyses

Sample	Min.	Integrated Age (Ma)	Plateau Age (Ma)	Plateau Information	Isochron Age (Ma)	Isochron or other Information
KDA-24 (376)	GL	25.5 ± 0.1	__	See Discussion	__	See Discussion
NGB-01	GL	13.6 ± 0.1	**13.7 ± 0.1**	8 of 12 fractions 58.7% ^{39}Ar release MSWD = 2.27	13.4 ± 0.1	8 of 12 fractions $^{40}Ar/^{36}Ar_i$ = 367.8 ± 23.6 MSWD = 0.42
NGB-09 (823)	AD	30.5 ± 0.8	__	See Discussion	__	See Discussion
KWDA-14 (397)	AD	12.6 ± 0.1	**12.6 ± 0.1**	5 of 10 fractions 72.3% ^{39}Ar release MSWD = 2.26	12.3 ± 0.2	5 of 10 fractions $^{40}Ar/^{36}Ar_i$ = 341.5 ± 34.0 MSWD = 1.72
GBDE-1	AD	13.4 ± 0.2	**12.1 ± 0.2**	7 of 10 fractions 70.1% ^{39}Ar release MSWD = 0.79	11.4 ± 1.3	7 of 10 fractions $^{40}Ar/^{36}Ar_i$ = 330.5 ± 75.2 MSWD = 0.68

Table 1a. Samples analyzed with monitor standard MMhb-1 using an accepted age of **513.9 Ma**. Ages cited in Ellis and Stroup (2015). Most robust ages are shown in **bold**. GL = Glass. AD = Adularia.

Sample	Min.	Integrated Age (Ma)	Plateau Age (Ma)	Plateau Information	Isochron Age (Ma)	Isochron or other Information
KDA-24 (376)	GL	26.1 ± 0.1	__	See Discussion	__	See Discussion
NGB-01	GL	13.9 ± 0.1	**14.0 ± 0.1**	8 of 12 fractions 58.7% ^{39}Ar release MSWD = 2.27	13.7 ± 0.1	8 of 12 fractions $^{40}Ar/^{36}Ar_i$ = 367.8 ± 23.6 MSWD = 0.42
NGB-09 (823)	AD	31.1 ± 0.8	__	See Discussion	__	See Discussion
KWDA-14 (397)	AD	12.9 ± 0.1	**12.8 ± 0.1**	5 of 10 fractions 72.3% ^{39}Ar release MSWD = 2.26	12.6 ± 0.2	5 of 10 fractions $^{40}Ar/^{36}Ar_i$ = 341.5 ± 34.0 MSWD = 1.72
GBDE-1	AD	13.7 ± 0.2	**12.4 ± 0.2**	7 of 10 fractions 70.1% ^{39}Ar release MSWD = 0.79	11.6 ± 1.3	7 of 10 fractions $^{40}Ar/^{36}Ar_i$ = 330.5 ± 75.2 MSWD = 0.68

Table 1b. Samples analyzed with monitor standard MMhb-1 using an accepted age of **523.5 Ma**. Ages recalculated after Ellis and Stroup (2015). Most robust ages are shown in **bold**. GL = Glass. AD = Adularia.

$^{40}Ar/^{39}Ar$ Analyses Discussion

KDA-24 *- Glass (GL)*

KDA-24 was collected from a split of HQ core of argillically altered tuff within the Tbx unit (Ellis and Stroup, 2015) from 376 to 379 feet depth in Goldbanks drill hole KDA-24. A glass separate from KDA-24 was analyzed to determine the approximate depositional age of the Tbx. The analysis produced an irregular age spectrum indicative of the presence of excess ^{40}Ar and/or alteration, therefore **no age determination is possible for this sample** (figure 1).

NGB-01 *- Glass (GL)*

NGB-01 was collected from a split of HQ core of argillically altered tuff within the Tbx unit (Ellis and Stroup, 2015) from 645 to 648 feet depth in Goldbanks drill hole NGB-01. A glass separate from NGB-01 was analyzed to determine the approximate depositional age of the Tbx. The integrated age (13.9 ± 0.1 Ma) is within error of the plateau age (14.0 ± 0.1 Ma) and broad error of the isochron age (13.7 ± 0.1 Ma). We prefer the plateau age of **14.0 ± 0.1 Ma** (figure 1) because of the higher precision and because of the large error on isochron derived initial $^{40}Ar/^{36}Ar$.

NGB-09 (823) *- Adularia (AD)*

NGB-09 (823) was collected from a split of HQ core from a mineralized quartz-adularia vein cutting the Tbx unit (Ellis and Stroup, 2015) at depth of 823 feet in drill hole NGB-09 from the southern Goldbanks Main Zone resource area. An adularia separate from sample NGB-09 (823) was analyzed to determine the age of mineralization. The integrated age (31.1 ± 0.8 Ma) is within broad error of both the plateau age (27.0 ± 1.6 Ma) and the isochron age (36.7 ± 4.4 Ma). Large errors on individual steps, a slightly irregular age spectrum and elevated Ca/K ratios suggest a heterogeneous sample. **We interpret this as a mixing age** (figure 2) with wall rock contamination affecting the age determination of adularia within the mineralized vein.

KWDA-14 (397) *- Adularia (AD)*

KWDA-14 (397) was collected from a split of HQ core from a mineralized quartz-adularia vein cutting the Tbx unit (Ellis and Stroup, 2015) at depth of 397 feet in drill hole NGB-09 from the Goldbanks KW resource area. An adularia separate from sample KWDA-14 (397) was analyzed to determine an age of mineralization. The integrated age (12.9 ± 0.1 Ma) is within error of both the plateau age (12.8 ± 0.1 Ma) and the isochron age (12.6 ± 0.2 Ma). We prefer the plateau age of **12.8 ± 0.1 Ma** (figure 2) because of the higher precision over the isochron age. We interpret this analysis to be the most robust age determination of adularia (age of mineralization) to date from the Goldbanks Au-Ag low-sulfidation epithermal system.

GBDE-1 *- Adularia (AD)*

This mineralized surface sample was collected from a sandstone outcrop containing quartz and adularia stock work veins and 2–10 mm fluorite crystals, 2.5 km northwest of the Goldbanks Main Zone resource area, near the collar of drill hole G-58. An adularia separate from sample GBDE-1 was analyzed to determine an age of mineralization. The integrated age (13.7 ± 02) Ma) is not within error of either the plateau age (12.4 ± 0.2 Ma) or the isochron age (11.6 ± 1.3 Ma). There is a slightly irregular age spectrum, but we prefer the plateau age of **12.4 ± 0.2 Ma** (figure 3) because of the higher precision over the isochron age, because of the large error on isochron derived initial $^{40}Ar/^{36}Ar$ and possible excess ^{40}Ar affecting the first three step heat gas releases.

$^{40}Ar/^{39}Ar$ Age Spectra for KDA-24 and NGB-01

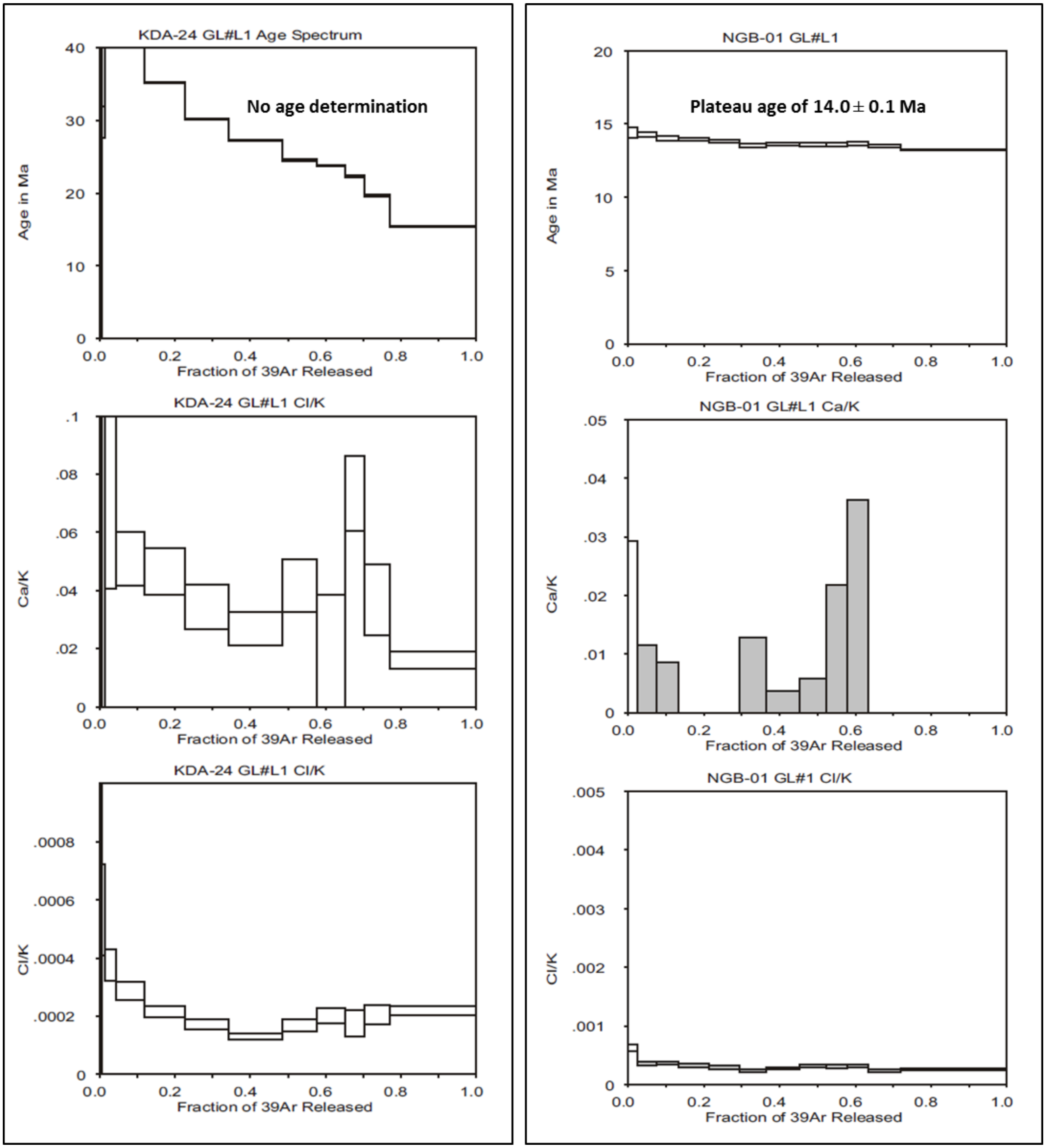


Figure 1 $^{40}Ar/^{39}Ar$ Age Spectra for KDA-24 and NGB-01.

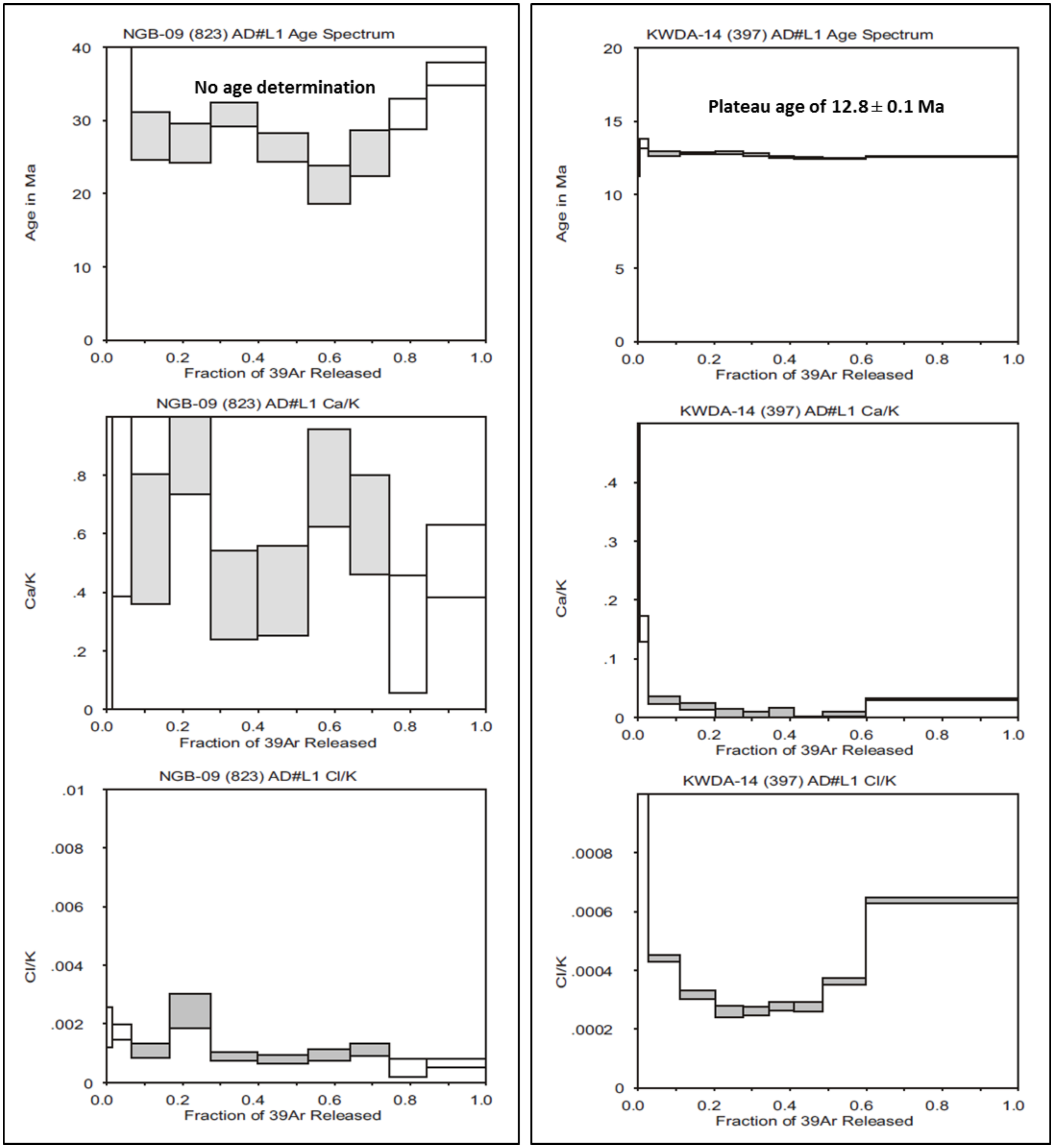


Figure 2. $^{40}Ar/^{39}Ar$ Age Spectra for NGB-09 and KWDA-14.

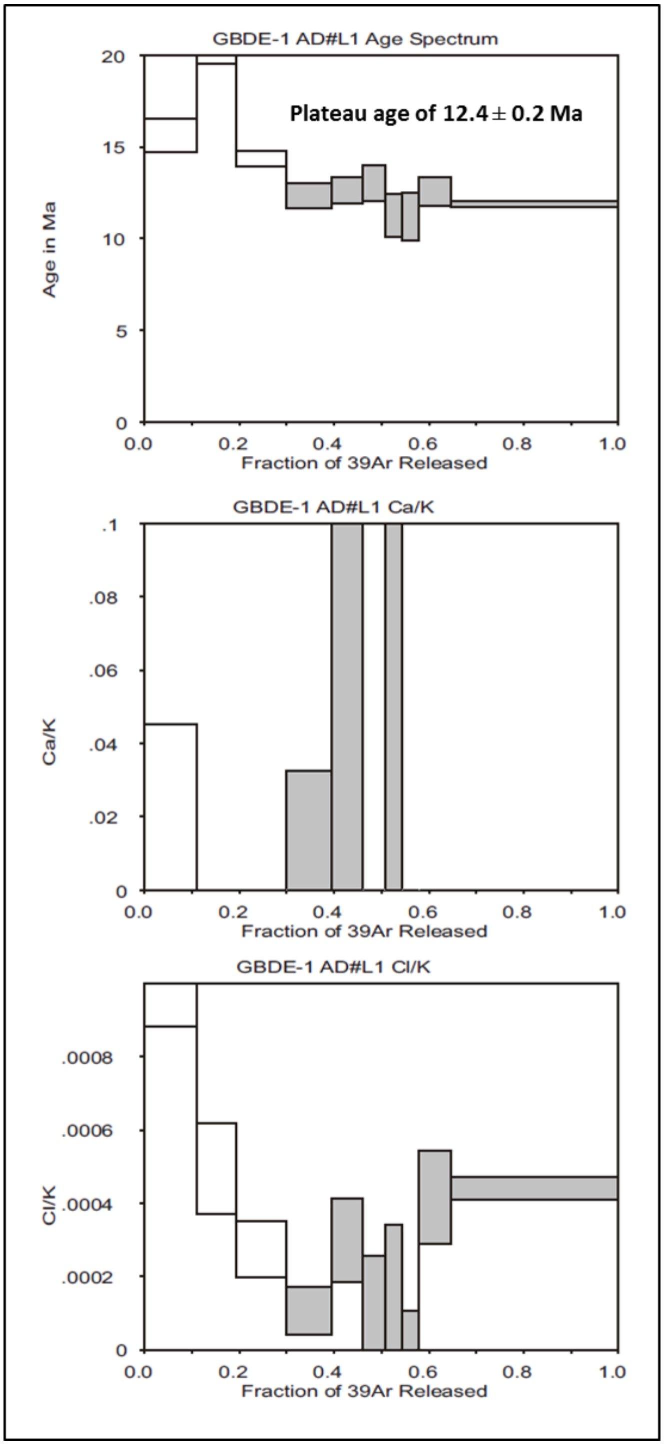


Figure 3. $^{40}Ar/^{39}Ar$ Age Spectra for GBDE-1.

U-Pb Analytical Methods

Four samples selected for U/Pb analysis by laser ablation inductively coupled plasma mass spectrometry (LA-ICPMS) were crushed, pulverized and processed by standard gravimetric and magnetic separation techniques to obtain zircon mineral separates. Zircon grains were hand-picked under alcohol, mounted in a 2.5 cm epoxy round mount with natural zircon standards, polished, and imaged by cathodoluminescence (CL) prior to laser ablation. U/Pb analysis was conducted at the Arizona Laserchron Center utilizing the Nu Instruments HR ICPMS and attached Photon Machines Analyte G2 Excimer laser following protocols of Gehrels et al. (2006, 2008). Each U/Pb analysis was completed using an ablation spot diameter of 30 µm and pit depth of approximately 15 µm. Common Pb corrections were made using ^{204}Hg-corrected ^{204}Pb measurements for each analysis, and initial Pb compositions of Stacey and Kramers (1975). U and Th concentrations and Pb/U fractionation were calibrated against the Arizona Laserchron Center Sri Lanka (SL) zircon standard (563.5 ± 3.2 Ma; ~518 ppm U and 68 ppm Th; Gehrels et al. 2008). Pb/U fractionation was monitored by a secondary standard as well (R33: 421 Ma; Black et al., 2004; Mattinson, 2010). Data reduction followed Gehrels et al. (2008) and concordia and weighted mean plots were made with Isoplot (Ludwig, 2008). ^{206}Pb/^{238}U ages are preferred for apparent ages less than 1000 Ma, and ^{207}Pb/^{206}Pb ages are used for analyses older than 1000 Ma. In cases where the ^{206}Pb/^{238}U and ^{207}Pb/^{206}Pb ages straddle 1000 Ma, the age with lower uncertainty is used.

Three samples selected for U/Pb analysis by secondary ion mass spectrometry (SIMS) at the U.S. Geological Survey-Stanford University SHRIMP-RG (sensitive high resolution ion microprobe-reverse geometry) facility were crushed, pulverized and processed by standard gravimetric and magnetic separation techniques to obtain zircon mineral separates. Aliquots for analysis were hand-picked under alcohol, mounted in epoxy resin with natural zircon standards before being polished to expose grain centers. Grains from each sample were imaged by CL prior to analysis to expose intra-grain zoning or complexity and aid in placing analytical spots. The U-Pb and trace element analyses were performed simultaneously following routines outlined in Barth and Wooden (2006) and Mazdab and Wooden (2006). Fractionation corrections were calibrated by replicate analysis of the zircon standard R33 (421 Ma; Black et al., 2004; Mattinson, 2010). The U concentration was calibrated with MAD-green (4196 ppm U, Barth and Wooden, 2010). The trace element routine collected 139La, 140Ce, 146Nd, 147Sm, 153Eu, 157Gd16O, 163Dy16O, 166Er16O, 172Yb16O, and 180Hf16O, with concentrations calibrated against zircon standard MAD (Mazdab and Wooden, 2006). Data reduction and plotting utilized programs Squid 1.13b (Ludwig, 2005) and Isoplot 3.60 (Ludwig, 2008).

Individual analyses from each sample and cathodoluminescence (CL) images with corresponding in situ zircon grain sample locations are included in this open file report, attached as .csv and .pdf files.

U-Pb SIMS Analyses Discussion

KOC2 *- Detrital Zircons (SIMS)*

KOC2 was collected from a split of HQ core of lithic sandstone, which was previously assigned a Tertiary age (Ellis and Stroup, 2015), was collected from 280 to 297 feet depth in drill hole KOC-02. Ductile fabrics observed in thin interlayered silt and clay layers within this lithic sandstone suggested a pre-Cenozoic age and the detrital zircon U/Pb data set was obtained to support this hypothesis. 51 zircons were analyzed from the aliquot with the **youngest age population at 1758 +/- 45 Ma** (figure 4). This Paleoproterozoic age strictly serves as a maximum for the deposition of this sandstone, though the lack of Cenozoic, Mesozoic, or Paleozoic zircon age populations suggests that the unit is pre-Cenozoic. Cenozoic sedimentary rocks in this location would be expected to contain locally derived detritus from Cenozoic and Mesozoic magmatic sources. Distinct age-probability peaks at 1825, 2070, and 2668 Ma (Figure 4A) correlate well with a sample of the Inskip Formation from the western East Range (Gehrels and Dickinson , 2000; Figure 4B), and until further work is completed, our preliminary assignment of this sandstone is to the Inskip Formation. A correlation of KOC2 to Harmony B (Figure 4B) is possible, though the Harmony B sample from Gehrels and Dickinson (2000) lacks a 2070 Ma peak.

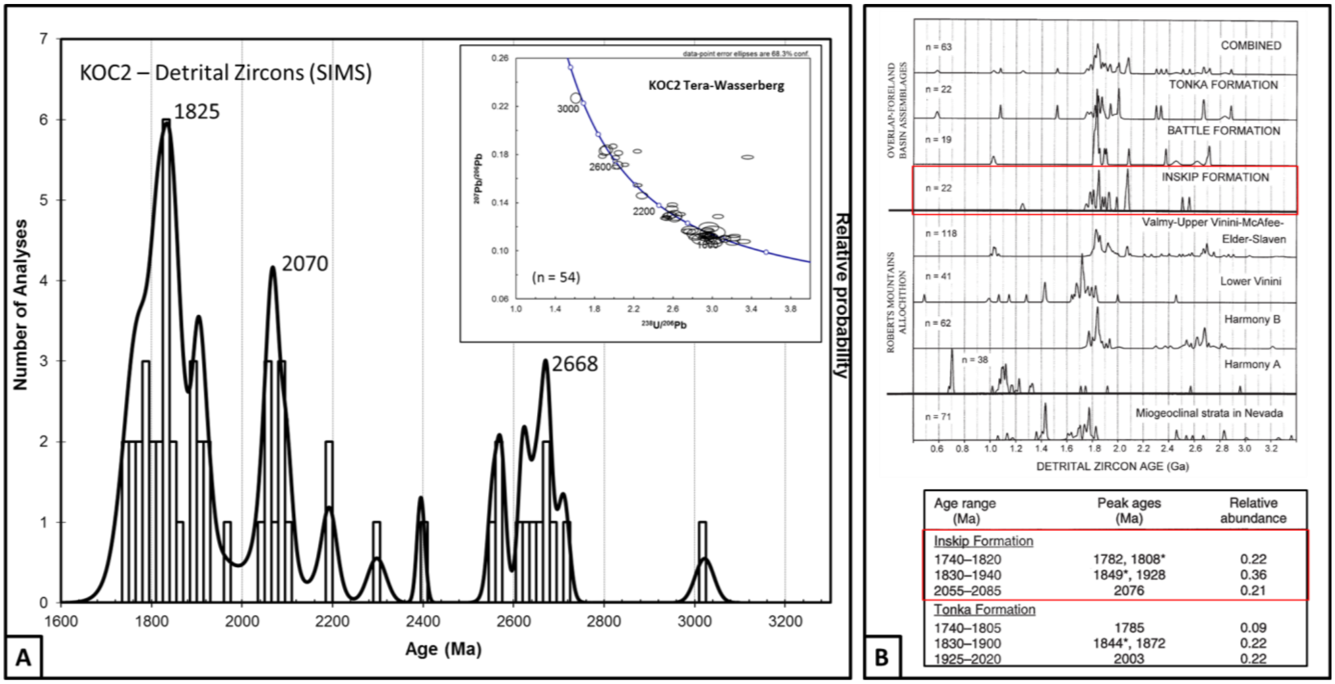
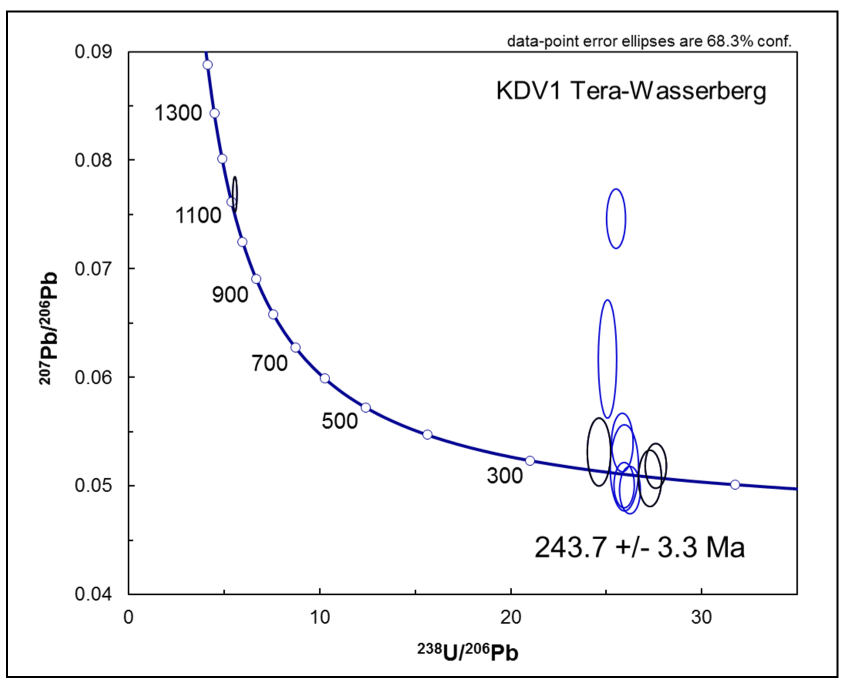


Figure 4. A. Relative Probability and Tera-Wasserberg diagram of sample KOC2. B. Cumulative probability plots of detrital zircon ages for strata of Antler overlap and foreland basin assemblages, Roberts Mountains allochthon, and miogeoclinal strata in Nevada (from Gehrels and Dickinson , 2000). Inskip Formation ages and cumulative probability plot highlighted in red for comparison to KOC2.

KDV1 *- Zircon (SIMS)*

KDV1 was collected from a split of HQ core of a porphyritic dacite dike TRd (Ellis and Stroup, 2015) from 1000 to 1015 feet deep in Goldbanks drill hole KDV-17. KDV1 was collected to determine the age of the intermediate to felsic dikes and sills which intrude the Mississippian-Permian Havallah sequence sediments and "lithic sandstone" (sample KOC2). These intrusive rocks were previously assigned a Cenozoic age because of the cross cutting relationship with the assumed Cenozoic age lithic sandstone (sample KOC2). A zircon separate from KDV1 was analyzed and U-Pb crystallization age determination for sample is **243.7 ± 3.3 Ma** (figure 5). Individual analyses are included in the attached SIMS .xls data file.

Figure 5. Tera-Wasserberg diagram of sample KDV1.



KWDA *- Zircon (SIMS)*

KWDA was collected from a split of HQ core from a weakly-altered medium-grained intermediate composition dike from a depth of 800 to 805 feet in Goldbanks drill hole KWDA-09. KWDA was collected to determine the age of the weakly altered to unaltered intermediate to mafic dikes, which intrude the Cenozoic sediments in the Goldbanks basin and are presumed to be related mid-Miocene bi-modal volcanism of the Northern Nevada rift. All the zircon grains in the KWDA sample were interpreted as inherited detrital components ranging from 1.0 to 2.2 Ga with no Phanerozoic igneous overgrowths. **No U-Pb crystallization age was determined for sample KWDA** (figure 6). Individual analyses are in the attached SIMS .xls data file.

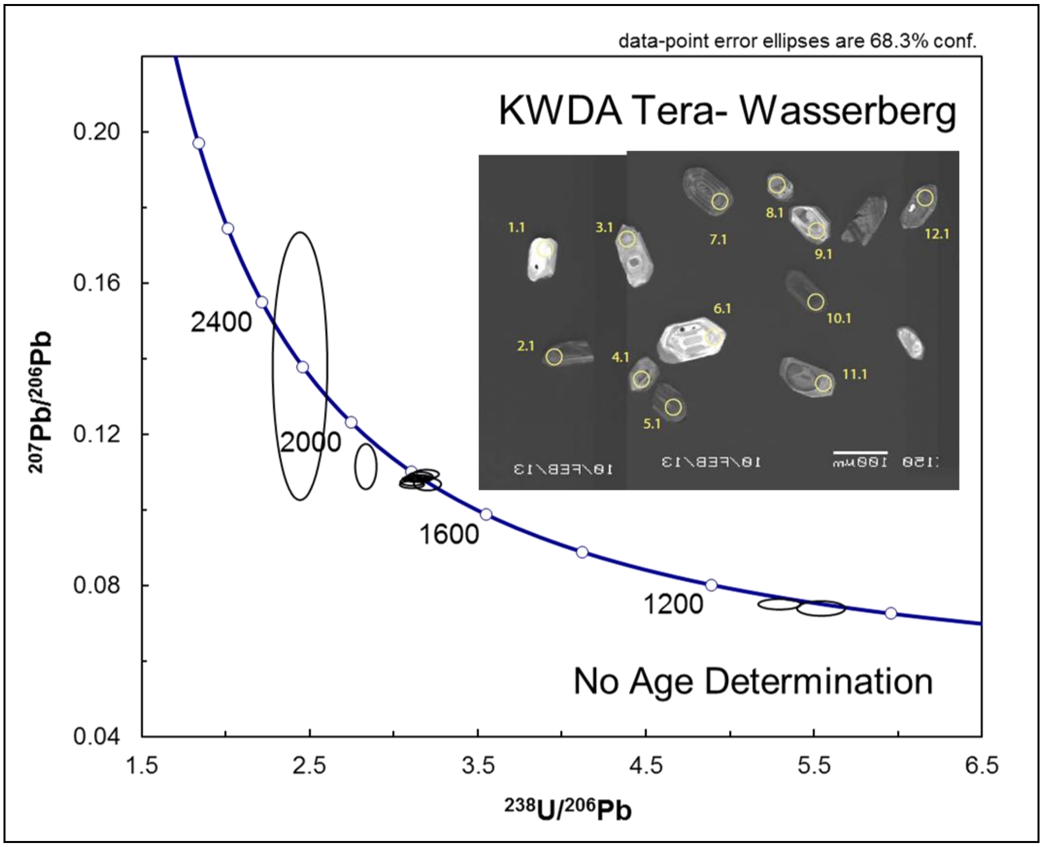


Figure 6. Tera-Wasserberg diagram and cathodoluminescence (CL) images with corresponding in situ zircon grain sample locations of sample KWDA.

U-Pb LA-ICPMS Analyses Discussion

01-1792 *- Zircon (LA-ICPMS)*

01-1792 was collected from a split of HQ core of banded rhyolite, assumed to be Triassic Koipato Group, TRk (Ellis and Stroup, 2015), from a depth of 1792 to 1796.3 feet in Goldbanks drill hole GB13-01. 01-1792 was collected to confirm the age of banded rhyolite exposed along the western margin of the Goldbanks basin. A zircon separate from 01-1792 was analyzed and U-Pb crystallization age determination for sample is **252.1 ± 2.0 Ma** (figure 7). Individual analyses are included in the attached LA-ICPMS .xls data file.

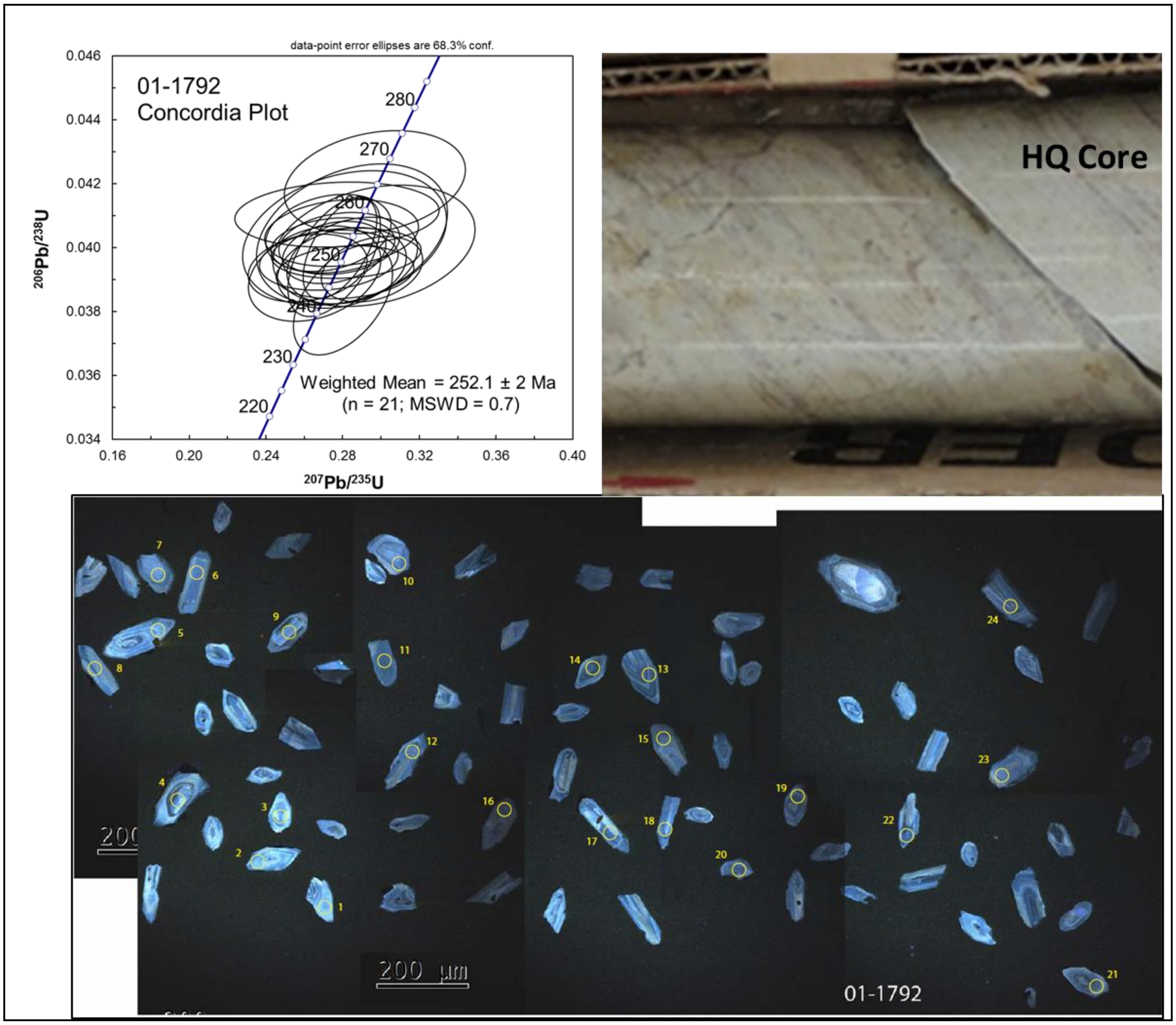


Figure 7. Concordia plot, core photo of sample 01-1792 and cathodoluminescence (CL) images with corresponding in situ zircon grain sample locations of sample 01-1792.

07-1360 *- Zircon (LA-ICPMS)*

07-1360 was collected from a split of HQ core of propylitically altered Tuff (Tbxt) within the Tbx fanglomerate unit (Ellis and Stroup, 2015), from a depth of 1360 to 1363.8 feet in Goldbanks drill hole GB13-07. 07-1360 was collected to date the deposition of the Tbx unit in the Goldbanks basin. A zircon separate from 07-1360 was analyzed and U-Pb crystallization age determination for sample is **15.3 ± 0.83 Ma** (figure 8). Individual analyses are included in the attached LA-ICPMS .xls data file.

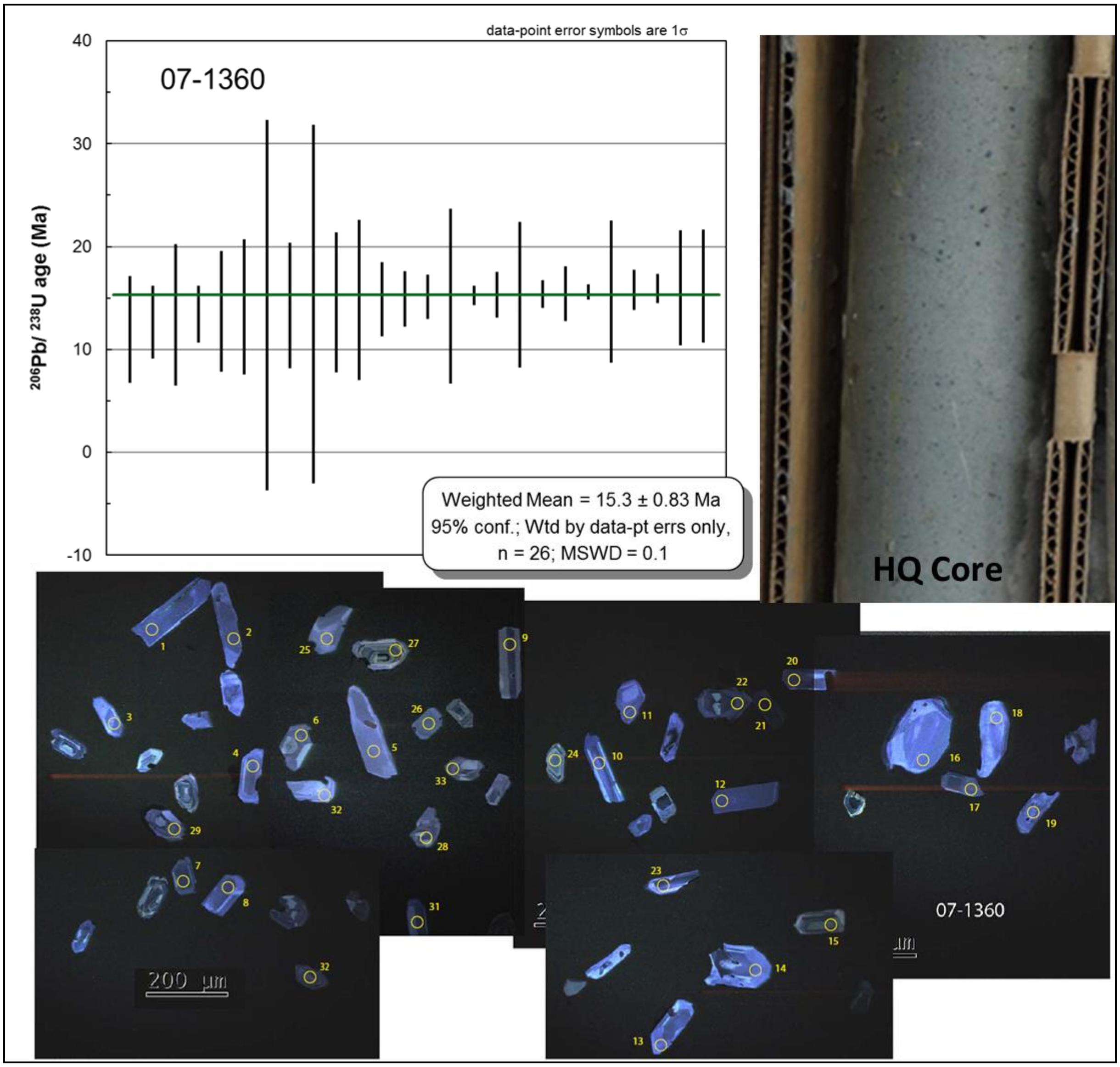


Figure 8. Weighted mean of analyses, core photo of sample 07-1360 and cathodoluminescence (CL) images with corresponding in situ zircon grain sample locations of sample 07-1360.

07-1581 *- Zircon (LA-ICPMS)*

07-1581 was collected from a split of HQ core of an andesite flow breccia, Ta (Ellis and Stroup, 2015), from a depth of 1581.3 to 1589.3 feet in Goldbanks drill hole GB13-07. 07-1581 was collected to date this previously undrilled volcanic unit within the Goldbanks basin graben. A zircon separate from 07-1581 was analyzed and U-Pb crystallization age determination for sample is **32.5 ± 1.1 Ma** (figure 9). Individual analyses are included in the attached LA-ICPMS .xls data file.

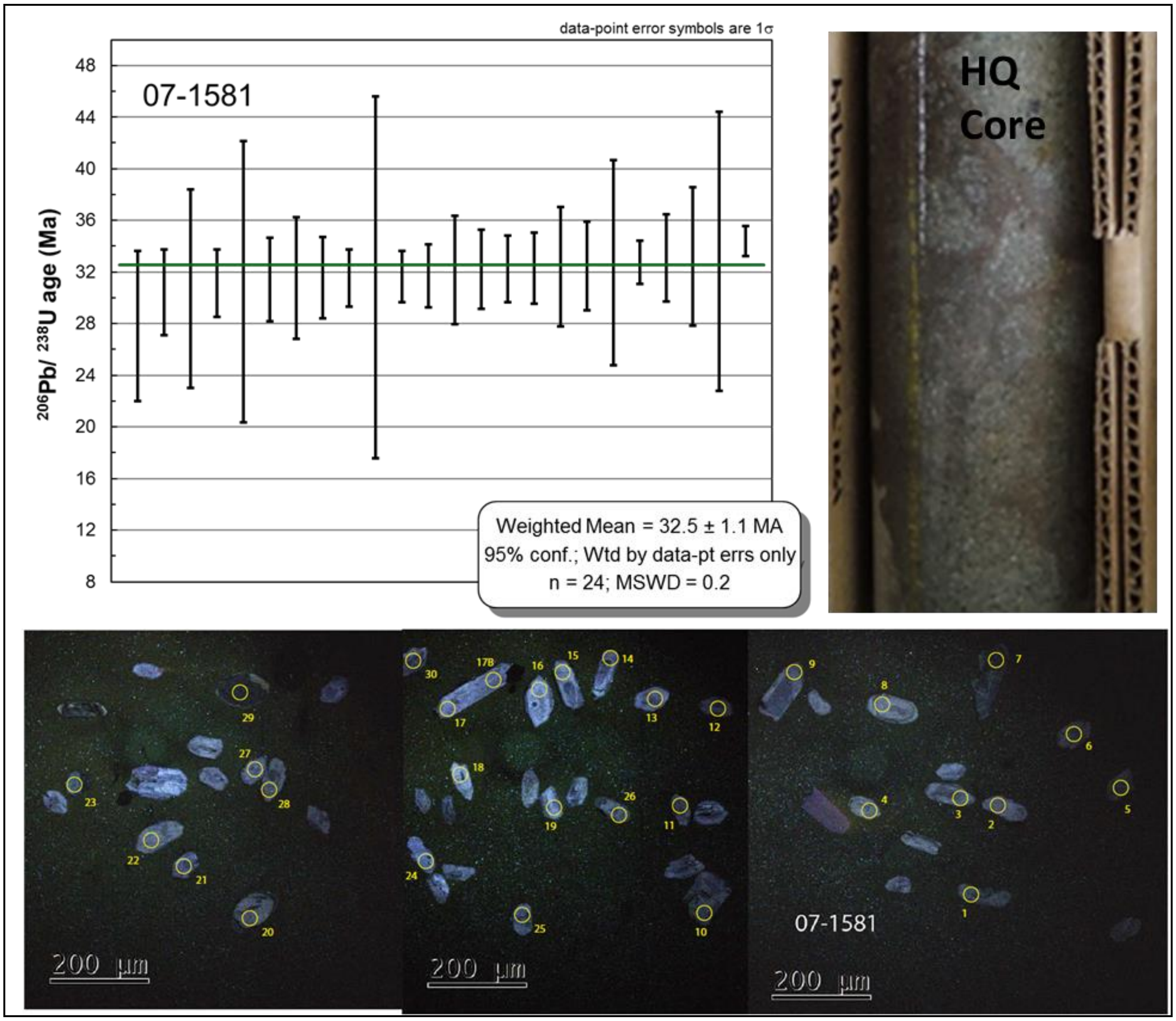


Figure 9. Weighted mean of analyses, core photo of sample 07-1581 and cathodoluminescence (CL) images with corresponding in situ zircon grain sample locations of sample 07-1581.

07-2202 *- Zircon (LA-ICPMS)*

07-2202 was collected from a split of HQ core of an intensely altered basaltic dike, Tbi (Ellis and Stroup, 2015), from a depth of 2021.8 to 2028 feet in Goldbanks drill hole GB13-07. 07-2202 was collected to date this previously undrilled, mineralized and altered intrusive unit within the Goldbanks basin graben. This unit is interpreted to be genetically related to the Goldbanks Au-Ag low-sulfidation epithermal system; however, the intense propylitic alteration of this unit renders the Ar/Ar method ineffective. As an alternative, a zircon separate from 07-2202 was analyzed to obtain a crystallization age. Unfortunately, the variable age populations of the zircons present in 07-2202, including a significant population of Cretaceous grains, suggest that **all of the zircons are inherited** (figure 10). Individual analyses are included in the attached LA-ICPMS .xls data file.

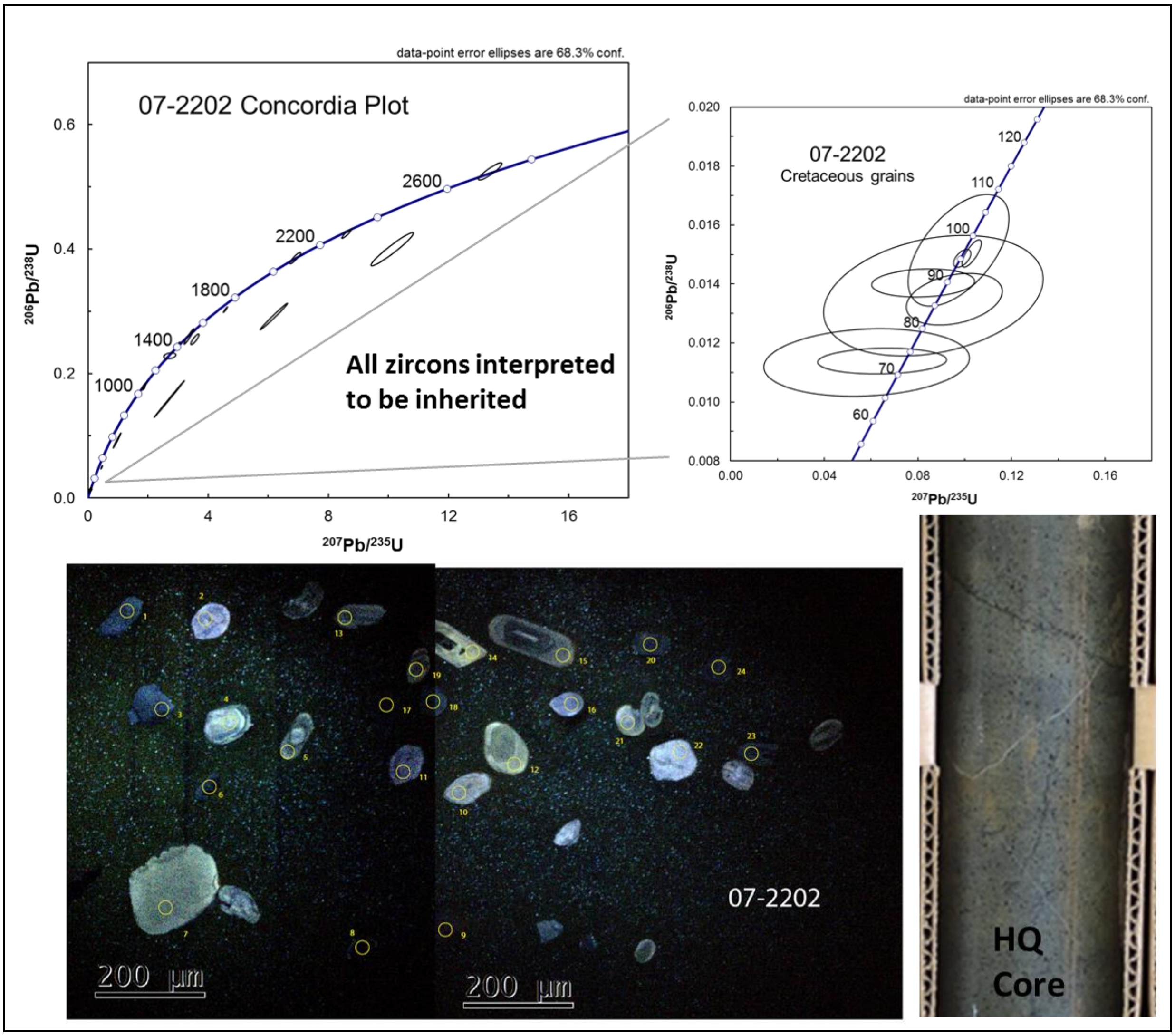


Figure 10. Weighted mean of analyses, core photo of sample 07-2202 and cathodoluminescence (CL) images with corresponding in situ zircon grain sample locations of sample 07-2202.

Summary Tables of all Geochronology Samples and Locations in this Study

U-PB Samples - SHRIMP-RG

Sample ID	Identifier Number from Table 2, Ellis and Stroup, 2015	Rock Unit *(as defined in Ellis and Stroup, 2015)*	Material	Sample Type	Drill Hole ID	Drill Collar UTM Nad 83m, Z11		Sample Collected Down Hole		Surface Sample UTM Nad 83m, Z11		Age (Ma)	Error (Ma)	Comments
						Easting	Northing	From (ft)	To (ft)	Easting	Northing			
KOC2	7	Mi (?) sandstone	Detrital Zircons	Drill Core	KOC-2	442405	4479896	280	297	-	-	1758	± 45	Max. age, youngest popultion of 51 grains
KDV1	5	TRd dacite dike	Zircon	Drill Core	KDV-17	442171	4480307	1000	1015	-	-	243.7	± 3.3	Crystallization Age
KWDA	not included	dacite dike	Zircon	Drill Core	KWDA-09	441477	4483452	800	805	-	-	No Age	-	See Discussion, All zircons inherited

U-PB Samples - LA-ICPMS

Sample ID	Identifier Number from Table 2, Ellis and Stroup, 2015	Rock Unit *(as defined in Ellis and Stroup, 2015)*	Material	Sample Type	Drill Hole ID	Drill Collar UTM Nad 83m, Z11		Sample Collected Down Hole		Surface Sample UTM Nad 83m, Z11		Age (Ma)	Error (Ma)	Comments
						Easting	Northing	From (ft)	To (ft)	Easting	Northing			
01-1792	6	TRk, banded rhyolite	Zircon	Drill Core	GB13-01	441604	4481025	1792	1796.3	-	-	252.1	± 2.0	Crystallization Age
07-1360	3	Tuff within Tbx	Zircon	Drill Core	GB13-07	441732	4481096	1360	1363.8	-	-	15.33	± 0.83	Crystallization Age
07-1581	4	Ta andesite flow	Zircon	Drill Core	GB13-07	441732	4481096	1581.3	1589.3	-	-	32.5	± 1.1	Crystallization Age
07-2202	not included	Tbi basaltic dike	Zircon	Drill Core	GB13-07	441732	4481096	2021.8	2028	-	-	No Age	-	See Discussion, All zircons inherited

Ar-Ar Samples **(ages modified from Ellis and Stroup (2015) using an accepted age of 523.5 Ma for standard MMhb-1)**

Sample ID	Identifier Number from Table 2, Ellis and Stroup, 2015	Rock Unit *(as defined in Ellis and Stroup, 2015)*	Material	Sample Type	Drill Hole ID	Drill Collar UTM Nad 83m, Z11		Sample Collected Down Hole		Surface Sample UTM Nad 83m, Z11		Age (Ma)	Error (Ma)	Comments
						Easting	Northing	From (ft)	To (ft)	Easting	Northing			
KDA-24	not included	Tuff within Tms	Glass	Drill Core	KDA-24	442383	4480358	376	379	-	-	No Age	-	See Discussion
NGB-01	2	Tuff within Tms	Glass	Drill Core	NGB-01	442093	4480882	645	648	-	-	14	± 0.1	Crystallization Age
NGB-09 (823)	not included	Main Zone vein adularia	Adularia	Drill Core	NGB-09	442041	4479786	800	805	-	-	No Age	-	See Discussion
KWDA-14 (397)	9	KW vein adularia	Adularia	Drill Core	KWDA-14	441477	4483440	397	397.5	-	-	12.8	± 0.1	Mineralization Age
GBDE-1	10	Tbxs vein adularia from surface	Adularia	Grab Sample, Outcrop	-	-	-	-	-	440163	4482488	12.4	± 0.2	Mineralization Age

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Suggested citation:

Ellis, J.R., Stroup, C.N., McClelland, W.C., Layer, P.W., and Benowitz, J.A., 2015, Analytical data accompanying "The Golden Devil Zone, a New Discovery in the Goldbanks District, Nevada" in *Geological Society of Nevada Symposium Proceedings May 18–21, 2015*: Nevada Bureau of Mines and Geology Open-File Report 15-10, 15 p.