

Rocky Mountain (56th Annual) and Cordilleran (100th Annual) Joint Meeting (May 3–5, 2004)

Paper No. 19-4

Presentation Time: 9:00 AM-9:20 AM

AGE AND PROVENANCE OF LOWER TERTIARY FLUVIAL STRATA, ELKHORN MOUNTAINS, E. OREGON

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Fluvial strata deposited on accreted Mesozoic terranes and buried by early to middle Tertiary volcanics are present in several high-elevation settings in the Elkhorn and Wallowa mountains of northeastern Oregon. The Elkhorn deposits at French Diggings and Camp Carson comprise gravelly sand deposited in generally NW-flowing, high-gradient rivers. Abundant clasts that were not derived from underlying basement were previously identified as having been derived from Belt quartzites and from authigenic cherts in Paleozoic carbonates. Newly discovered boulders of light-pink quartzite contain vertical sand-filled tubes that we interpret to be Skolithos, an early Cambrian trace fossil. Heavy minerals separated from three samples of sandstone contain abundant detrital kyanite and several populations of detrital zircon. Zircon U/Pb ages range from ~45 to 1800 Ma, but most grains are ~70-90 Ma, with subordinate peaks at ~60 Ma, 100-120 Ma, and ~1400 Ma. The ~45-Ma ages show the maximum age of the sediments is middle or late Eocene. Ongoing He-Pb double-dating of the detrital zircons will more tightly constrain the depositional age and provenance. The size of the exotic cobbles and boulders, up to 60 cm in diameter, and the width and spacing of the river channels indicate that the source of the exotic clasts lay within 100 km, E or SE of the deposits. We propose that the provenance, in early Tertiary time, comprised Challis-type volcanics, lower and possibly upper Paleozoic miogeoclinal strata, and Belt Supergroup. These rock units were situated above and eroded from either the southern lobe of the Idaho batholith, or the accreted terranes immediately west of the Salmon River suture zone.

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Boise Centre on the Grove: Douglas Fir

8:00 AM-12:00 PM, Tuesday, May 4, 2004

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