Internal Architecture Of the Proto-Kern Canyon Fault At Engineer's Point, Lake Isabella Dam Site, Kern County, California*

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Abstract

The core of the Cretaceous (?) proto-Kern Canyon Fault (KCF) is exposed continuously for 1.25 km along Engineers Point at Lake Isabella, Kern County, California. The proto-KCF is notable for (1) its long and complex history within, and perhaps preceding the Sierra Nevada batholith, and (2) hosting the Quaternary Kern Canyon Fault, an active fault that threatens the integrity of the Lake Isabella auxiliary dam and surrounding communities. We are investigating the internal architecture of the proto-KCF to explore its control on the likely behavior of the modern KCF. The proto-KCF is developed in the Alta Sierra biotite-granodiorite pluton. A traverse across Engineers Point, perpendicular to the proto-KCF trace, reveals gradational increases in fracture density, fracture length, bulk alteration, and decreases in fracture spacing and grain size toward the fault core. Mapping of the fault core reveals two prominent and laterally extensive zones: (1) continuous foliated blastomylonitic granodiorite with steeply dipping, anastomosing shear bands and minor mylonite planes, and (2) foliated orange and green fault breccia with intergranular gouge, strong C/S fabric, and a central gouge plane. The fault breccia zone is intruded by a lensoidal, post-deformation dacite dike, probably ca. 105 - 102 Ma (Nadin and Saleeby, 2008) and is weakly overprinted by a set of crosscutting spaced, short, brittle fractures, often coated in calcite, which we infer to be genetically related to the modern KCF. We present our structural and lithological data that will be supported by mineralogical and geochemical analyses

Reference Cited

Nadin, E.S., and J.B. Saleeby, 2008, Disruption of regional primary structure of the Sierra Nevada batholith by the Kern Canyon fault system, California: Geological Society of America Special Paper 438, p. 429-454.
The core of the Cretaceous (?) proto-Kern Canyon Fault (KCF) is exposed continuously for 1.25 km along Engineer’s Point at Lake Isabella, Kern County, California. The proto-KCF is notable for (1) its long and complex history within, and perhaps preceding the Sierra Nevada batholith, and (2) hosting the Quaternary Kern Canyon Fault, an active fault that threatens the integrity of the Lake Isabella auxiliary dam and surrounding communities. We present our preliminary structural and lithological data that are supported by mineralogical and geochemical analyses.