

Multi-Method Detrital Thermochronology of the Great Valley Group and its Implications for Petroleum Generation in the Vallecitos Syncline

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Zircon and apatite fission track dating and vitrinite reflectance measurements were performed on Cretaceous through Miocene sediments of the Great Valley Group and the Temblor Formation in the vicinity of Coalinga and New Idria (west-central California). The data show that the New Idria serpentinite diapir rapidly exhumed at ~12-14 Ma, simultaneously with the passage of the Mendocino triple junction. This Middle Miocene timing also coincides with the deposition of spectacular deposits of sedimentary serpentinite (Big Blue Formation). The rapid rise of the hot serpentinite body created a thermal halo which may have provided the enigmatic heat source for oil fields of the shallow Vallecitos Basin, a few miles north of New Idria.