Neogene basaltic volcanism occurs at four locations in the Owens Valley, the Big Pine field south of Independence, the Darwin field 40 miles to the southeast on the Darwin Plateau, the Coso field north of Ridgecrest, and the CA field in the El Paso Mountains. Big Pine basalts range in composition from olivine tholeiite to quartz tholeiite, and are believed to be the result of mantle plume activity. The Coso field is characterized by olivine basaltic volcanism. Basalts are relatively basaltic and normative alkali basalts with high FeO contents, and are rich in normative olivine. The Darwin field is characterized by olivine basaltic volcanism. Basalts are relatively basaltic and high in normative olivine. The Coso field is characterized by olivine basaltic volcanism. Basalts are relatively basaltic and high in normative olivine.

Owens Valley magnetism spans the transition from the late Miocene to the Pliocene. The Pliocene-Pleistocene age of the Owens Valley magnetism is consistent with the extensional setting having a significant influence on basalt composition. Basalts that are the products of extension (Ricardo) are tholeiitic while those emplaced in regions of transtension or oblique to dominant basaltic faults. The Big Pine basalts underwent a compositional change from older tholeiites to enriched olivine tholeiites. This may be related to changes in the regional stress pattern from Basin and Range extension to the current regime of right-lateral sinistral slip along the Garlock fault. The Big Pine field exhibits a distinct compositional evolution from tholeiitic to enriched olivine tholeiites. The composition of Big Pine basalts is consistent with the evolution of rifting along the EMI trend (EMII is a reservoir created from melting average continental crust), requiring crustal extension.

The Darwin field is characterized by bimodal, alkali basaltic volcanism. Basalts from the Big Pine and Darwin fields are the most extensional in their component suite, whereas the Coso field basalts are the least extensional. Recent volcanism in the Darwin field is considered to have been controlled by extensional tectonics and basaltic volcanism, with no interaction with the crust. The Owens Valley has a long history of volcanic activity, with the onset of sinistral slip along the Garlock fault and the initial phase of east-west Basin and Range extension occurring during the Miocene. Volcanism continued through the Pliocene and Pleistocene, with the most recent activity occurring during the late Holocene.

The volcanic rocks of the Owens Valley are characterized by a spectrum of compositions, ranging from tholeiitic to alkali basalt. The petrochemical and isotopic data indicate that the volcanic rocks of the Owens Valley are the result of differentiation processes that occurred in the mantle, rather than in the crust. The volcanic rocks are the products of partial melting of a common mantle source, which was then modified by crustal contamination.

Recent volcanism in the Owens Valley has been controlled by extensional tectonics and basaltic volcanism, with no interaction with the crust. The volcanic rocks of the Owens Valley are characterized by a spectrum of compositions, ranging from tholeiitic to alkali basalt. The petrochemical and isotopic data indicate that the volcanic rocks of the Owens Valley are the result of differentiation processes that occurred in the mantle, rather than in the crust. The volcanic rocks are the products of partial melting of a common mantle source, which was then modified by crustal contamination.

Recent volcanism in the Owens Valley has been controlled by extensional tectonics and basaltic volcanism, with no interaction with the crust. The volcanic rocks of the Owens Valley are characterized by a spectrum of compositions, ranging from tholeiitic to alkali basalt. The petrochemical and isotopic data indicate that the volcanic rocks of the Owens Valley are the result of differentiation processes that occurred in the mantle, rather than in the crust. The volcanic rocks are the products of partial melting of a common mantle source, which was then modified by crustal contamination.

Recent volcanism in the Owens Valley has been controlled by extensional tectonics and basaltic volcanism, with no interaction with the crust. The volcanic rocks of the Owens Valley are characterized by a spectrum of compositions, ranging from tholeiitic to alkali basalt. The petrochemical and isotopic data indicate that the volcanic rocks of the Owens Valley are the result of differentiation processes that occurred in the mantle, rather than in the crust. The volcanic rocks are the products of partial melting of a common mantle source, which was then modified by crustal contamination.

Recent volcanism in the Owens Valley has been controlled by extensional tectonics and basaltic volcanism, with no interaction with the crust. The volcanic rocks of the Owens Valley are characterized by a spectrum of compositions, ranging from tholeiitic to alkali basalt. The petrochemical and isotopic data indicate that the volcanic rocks of the Owens Valley are the result of differentiation processes that occurred in the mantle, rather than in the crust. The volcanic rocks are the products of partial melting of a common mantle source, which was then modified by crustal contamination.