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Samples have been obtained from along the Rio Grande Rift in southern New Mexico in order to understand the evolution of regional volcanic melts. Lead isotope data has been collected from the Potrillo Mountains, located approximately 35 km to the southwest of the city of Las Cruces, New Mexico, as well as the Elephant Butte region and the Hillsboro Volcanic Field (HVF), both of which are located in Sierra County, New Mexico. The lead isotopes, combined with a few available strontium isotope ratios from this area, suggest that upper mantle melts initially interacted with lower crust, and then were contaminated by variable amounts of upper crust. By running the samples through ion exchange columns, strontium was separated out in order to measure strontium isotope ratios on the UTEP Geology multi-collector mass spectrometer. This allows analysis of the origin of the melts of particularly the HVF, which shows the highest lead isotope ratios and may therefore contain the largest upper crustal contribution. The combined strontium-lead isotope data allows for a critical test of this hypothesis, while a comparison of isotope ratios obtained for rock standards with ratios obtained in other laboratories provides a test of our technique.