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Geochemical Reconnaissance of Tungsten and Molybdenum Deposits in the Mojave Desert, California

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Middle- to late- Mesozoic calc-alkaline magmatic intrusions are recognized to be associated with tungsten and molybdenum mineralization throughout the southwestern United States. A hypothesized belt of early- Cenozoic alkaline to calc-alkaline intrusions may also host tungsten and molybdenum. However, the extent of these associations, deposit characteristics, and timing of mineralization events are not well understood.

To help address this, the California Geological Survey is conducting reconnaissance geochemical sampling of tungsten and molybdenum ore materials, alteration assemblages, and potential host rocks in the Mojave Desert. Specifically, this project investigates tungsten and molybdenum mineralization in a suite of alkaline to calc-alkaline intrusions stretching from southeastern California eastward to Texas that are associated with late- to post- Laramide related magmatism.

California has historically played an important role in domestic tungsten mining, beginning in 1905 in the Atolia District and 1914 at the Pine Creek Mine in San Bernardino and Inyo Counties, respectively. Past producers and prospects of the Mojave served as targets for this sampling. To date, 80 samples have been collected across seven historical districts in the Mojave. Preliminary geochemical analyses reveal concentrations as high as 15,000 ppm tungsten and 2,000 ppm molybdenum and elevated copper, silver, and gold.

In addition to geochemistry, we collected samples for petrographic analyses and zircon U-Pb geochronology. Results will be included in a report authored jointly with other state geological surveys. Additional products of this work will include compiled geochemical and geochronological datasets for the project area.

This work is supported by a larger USGS Earth Mapping Resources Initiative collaboration between the California, Arizona, New Mexico, and Texas geological surveys that aims to characterize the geochemistry of tungsten and molybdenum deposits in the desert southwest.