

Rift shoulder, HREE-enriched, mega-sized deposits in west Texas, USA

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Rift shoulder, HREE-enriched, laccolith-hosted, mega-sized, deposits are present in west Texas, 100 miles southeast of El Paso, Texas, USA. The approximately 36 Ma felsic igneous rock bodies with typical-A-type geochemistry formed very near an intra-cratonic boundary, the Texas Lineament of the North American craton, as part of the initiation of the Rio Grande Rift. The igneous bodies were emplaced as topaz rhyolite associated with a LCT (Li, Cs, Ta) event of pegmatite geochemistry. It is speculated that about 10,000 feet beneath the topaz rhyolites, there is a deeper porphyry Mo deposit similar to those found at Climax, Colorado, Questa, New Mexico, also on the eastern side of the Rio Grande Rift. This porphyry Mo system is assumed to be genetically linked to the over-lying topaz rhyolites. Late-stage degassing of that igneous body produced pervasive alteration of the rhyolitic laccoliths having the geochemical affiliation NYF (NB, Y F). This involves leaching of quartz and zircon (these rocks are virtually devoid of any zircons) and deposition of albite, fluorite, cryolite and other phases in a Na-F metasomatic event such as episyenitic albitization. The zircon and quartz dissolution and/or instability is primarily related to the enhanced fluorine activity. HREEs are found substituting for Y in Yttrifluorite, YF_3 . The proposed ore is the rock of the laccoliths, Round Top and Little Blanca.

The discovery is owned by the Texas Rare Earth Resources. A preliminary assessment has been produced from the study of 106 recent 400-foot drill holes and one 1000 feet hole with REE analyses every five feet. Earlier U and Be resources were documented at the intrusive contact with the Cretaceous limestone. Supplemented by data from 72 surface samples, it is documented that the laccoliths are very uniform in geochemistry and contain approximately 500 ppm total REE with HREE being more enriched than the LREE. Verified and inferred resources have been calculated. At least 18000 tons of Ho are present. Metallurgical investigations have been carried out.

In conclusion, HREE-enriched deposits may be much more common than previously thought. Does every porphyry molybdenum deposit on the rifted shoulder have a potential HREE halo? is an interesting question. Most Mo properties are not analyzed for HREE