

Ash-fall deposits of rare earth elements: a new deposit type?

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The Çanakli rare earth element (REE) deposit, a part of the Aksu Diamas project in western Turkey, owned by AMR Mineral Metal Inc., has an inferred resource of 494 million tonnes at 0.07% TREO (total rare earth oxide) in unconsolidated sediments at surface. This deposit is a potentially important source of European REE supply. REE-bearing heavy minerals occur in Quaternary-aged lenses and are disseminated in channelised debris flows, with no obvious source within the Mesozoic limestone basin catchment. However, the alkaline Gölcük volcano is located approximately 20 km north-west of the deposit and repeatedly erupted during the Plio-Quaternary [1]. The eruption-related ash falls represent a potential source of REE-bearing minerals.

Chemical fingerprinting of both major minerals, such as magnetite and pyroxene, and minor REE-bearing minerals, such as allanite and chevkinite, shows that Gölcük is almost certainly the source of the REE-bearing minerals at Çanakli. This deposit is thus an ash-fall placer, a new type of REE deposit. Improved understanding of the origin of this deposit type will aid identification of additional REE resources in similar settings globally, including those at Monte Vulture, Italy.

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[1] Platevoet *et al.* (2014) *J. Asian Earth Sci.*, **92**, 53-76.