Rare Earth Element – REE – Deposit Khaldzan-Buregtey
Myangad Province, Mongolia

Personal Reference Dr. R. Schwarz¹, Dipl.-Berg.-Ing. K.-D. Markus², Dipl.-Ing. E. Pusch³

Location and Infrastructure

The deposit is situated in Western Mongolia approximately 45 km northeast of the city Khovd and about 12 km to the northeast of the village Myangad. Access to the regional and national transportation network is assured by a paved road located 15.0 km away. Direct access to the deposit is currently only possible via an unpaved road.

Approximately 2 km away there is a 110 kV power line. Possible water supply can be ensured by the Khovd and Buyant rivers located 8.0 and 12.0 km away respectively.

Coordinates of the concession area

48° 24' 29"  91° 56' 30"
48° 24' 29"  91° 57' 15"
48° 23' 57"  91° 57' 15"
48° 23' 57"  91° 56' 30"

¹ Dr. R. Schwarz developed the project and was project manager in charge over the whole period.
² Mr. Markus is mining engineer and was deputy project manager in charge.
³ Ms. Pusch was member of project team.
Geology

The Khaldzan-Buregtey rare earth element, REE, deposit is part of the plutonic massif of the same name occurring within the Tsagan-Shibetin fault zone which separates the lake zone in the west from structural zones of the Mongolian Altai.

It consists of rare-metal peralkaline granites, pantellerites, and comendites (peralkaline rhyolite), as well as albitic nepheline syenites.

Exploration

The deposit was discovered in 1983 by a Soviet-Mongolian expedition. Following this, various detailed studies were undertaken through 1991 (geomagnetic mapping, prospecting, drilling, geochemical investigations, etc) by order of a Mongolian company. Based on the verification of the plausibility of old documents, further exploration was conducted from 2008 to 2009 by G.U.B. Ingenieur AG, Germany (Project Manager: Dr R. Schwarz) including aerial mapping, creation of DEM, mineralogical-geochemical investigations, block modeling of the deposit with GEMCOM SURPAC™, estimation of resources, etc.

Deposit geology and mineralization

To the north and east the orebody is bounded by two main fault systems and in the south and southwest by a pegmatite seam. The size of the orebody is approximately 0.81 km².

The peralkaline granite syenite plutons show Zr-Y-Nb-REE mineralization for which magmatic enrichment and hydrothermal concentration of rare metal and earth elements are characteristic. The rare earth elements are found, among other places, in the minerals zircon, bastnäsite, monazite, pyrochlore, synchysite, and xenotime.

Estimated resources

The highest concentrations of Zr, Nb, Ta, Y, and REE are in the top part of the intrusion.

According to present discoveries, the resources could be identified as “inferred” according to the JORC Code (2004).

Within the licensed area at an elevation of 1,700 to 1,980 m the inferred ore reserves are approximately 2.5 million tons (G.U.B. Ingenieur AG 2009).
Possibilities for use and economic situation

The rare earth elements encompass a total of 17 elements, including yttrium, scandium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium. REE are for the most part used as misch metals in steel production for making catalysts in the petrochemical industry, for refractory brickworks, for electrotechnical electronic applications and in the glass industry. 95% of the total amount of metal used in production worldwide is imported from China by the major industrial countries.

Zircon is used in the manufacture of fire-resistant products, abrasive materials, and as constituents in foundry sands (U.S. Geological Survey 2009). The most important deposits are in Australia, South Africa, China, Ukraine, Brazil, and USA. Each year around 1,360,000 tons of zirconium are extracted worldwide (U.S. Geological Survey 2009). Niobium is primarily used in the steel industry to produce alloys. Tantalum is used for the manufacture of capacitors, steel alloys, and cutting tools (U.S. Geological Survey 2009). In 2007, the most important countries where tantalum ores are mined were Australia (435 tons), Brazil (180 tons), and Canada (45 tons) (U.S. Geological Survey 2009).
Assessment

The Khaldzan Buregtey rare earth element deposit is classified as a REE deposit capable of being invested in and developed (BGR 1997, Pui-Kwan 2002). The general conditions regarding the deposit, such as its proximity to the Aimak center of Khovd, its proximity to the tungsten and silver mining regions of western Mongolia, the good access to transportation routes and its proximity to the Khovd and Byangad Rivers, are estimated as advantageous. For the licensed area, the inferred resources (according to JORC Code 2004) are approximately 2.5 million tons within the area explored at an elevation of 1,700 to 1,980 m (G.U.B. Ingenieur AG 2009).

Recommendations

Statements regarding the distribution of the ore qualities and the calculation of the resources and reserves for the Khaldzan Buregtey deposit can only be made after a further stage of exploration (drilling program, detailed mapping, geochemical-mineralogical investigations, trials concerning processing, etc.).

References: