

# Prospects for the safe development of the Lovozero rare-metal deposit at deep horizons

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Prospects for mining the Lovozero rare-metal deposit at deep horizons.

The Lovozero rare metal deposit has been operated by the Karnasurt mine since 1951. The mine mines 2 thin (1 m each) gently dipping layer-like ore deposits, separated by a 100 m thick interlayer, from the outcropping deposits to the day surface. At present, the development of the lower deposit has stopped at +280m (the maximum depth from the surface is 600m). It is planned to mine deposits until 2035, up to 0m from the surface, when the depth of mining will reach 900m from the surface. The Lovozero deposit as a whole and the Karnasurt mine in particular are classified by the Gosgortekhnadzor of the Russian Federation as threatened and prone to rock bursts, that is, all deep horizons of the mine planned for mining are rock burst hazardous.

The development of ore deposits at the mine is carried out by a continuous development system with the maintenance of the overlying rock strata with belt near the drift, between the wells and isolated pliable intra-block pillars. The pillars are the most impact-prone elements of the development system. The calculation of the dimensions of the pillars for the deep horizons of the mine was carried out. To protect against the danger of rock bursts, the formation of unloading slots in the pillars is provided. The calculation of the dimensions of the pillars with and without regard to unloading slots was carried out. To ensure safety against rock bursts of intra-block pillars, camouflage blasting of holes in them is provided, which ensures compliance of the pillars and safety against rock bumps.

Due to these preventive measures, the safety of mining operations at deep horizons is ensured by the factor of rock bumps.