



## **The use of natural heat and cold resources for mining in Zabaikalie cryolithozone**

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Usually permafrost is considered as a natural phenomenon severe hindering to economical development of the territories. However it is not quite right. In some cases permafrost complicates, and in others - favors to solve the problems of the nature management.

At present time new gold ore deposits are put into operation in Zabaikalie's mountains with continuous permafrost. The strategy of their development is formed up so that to alleviate the negative influence of permafrost and also to use reasonably the favorable features of the territory. Among the planned technical decisions and methods it is worth to note the following ones.

One of the permafrost regional features is significant total thickness of exogenous fissuring zone. Taking this into account the mining projects call for the hydraulic hammer usage instead of conventional drilling and blasting operations. It allows not only reducing the mining price but also at the same time raising the environment protection level.

To provide stability of the mills and other structures the cooling of the foundation basement with heat pumps is offered to use. It will give a possibility to decrease the building cost and to utilize the extracted energy for the heat supply indoors. The water supply reservoir posses sufficient heat reserves for that.

The food can be stored in the ice food depots of M.Krylov's system that were successfully operated in Russia in the middle of XX century.

Despite of a bleak climate Zabaikalie has enormous renewable heat sources. It is es-

established that during summer daylight hours the heat flow about  $1 \text{ kW/m}^2$  comes from atmosphere on the surface of naked frozen ground. It allows applying the heat water supply using the simplest water heaters made of the film hooves.

In this connection it is necessary to emphasize the extremely important role of the geocryological investigations that help to organize the rational nature management.