

Geologic structure of Gofitsky deposit of titanium and zirconium and perspectives of the reserve base of titanium and zirconium in Russia

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With the fall of the Soviet Union, all the mining deposits of titanium and zirconium appeared outside of Russian Federation. Therefore the studying of deposits of titanium and zirconium in Russia is very important nowadays. There is a paradoxical situation in the country: in spite of possible existence of national mineral resource base of Ti-Zr material, which can cover needs of the country, Russia is the one of the largest buyers of imported Ti-Zr material in the world. Many deposits are not mined, and those which are in the process of mining have poor reserves. Demand for this raw material is very great not only for Russia, but also for the world in general.

Today there is a scarcity of zircon around the world and it will only increase through time. Therefore prices of products of titanium and zirconium also increase. Consequently Russian deposits of titanium and zirconium with higher content than foreign may become competitive. Russia is forced to buy raw materials (zirconium and titanium production) from former Soviet Union countries at prices higher than the world's and thus incur huge losses, including customs charges.

Russia should create its own mineral resource base of Ti-Zr. Studied titanium-zirconium deposits of Stavropol region may become the basis for the south part of Russia. At first, Beshpagirsky deposit should be pointed out. It has large reserves of ore sands with high content of Ti-Zr. A combination of favorable geographical position of the area with developed industrial infrastructure makes it very beneficial as an object for high priority development.

Gofitsky deposit should be pointed out as well. Its sands have a wide areal distribution and a high content of titanium and zirconium.

Chokrak, Karagan-Konksk and Sarmatian sediments of the Miocene of Gofitsky deposit are productive for titanium and zirconium placers within Stavropol region of Russia. Gofitsky deposit was evaluated from financial and economic point of view and the following data were received (USGS, 2005):

1. The draft forecasts the highest positive net present value (NPV= 1712879.6 thou. \$) to a company that uses a discount rate of 15%.
2. The present value factor is quite high (PVR = 9.02), and means that the company will receive \$9.02 discounted profit per dollar invested. Profitability index is higher than 1 (PI = 1.3) and indicates that the project is profitable, but it is volatile in term of investment.

All these features make the project highly controversial for a company, but with an increase of price of titanium and zirconium raw materials it will improve the attractiveness of Gofitsky deposit for development.

As a result:

- common patterns of geological structure of Gofitsky deposit field are determined
- mineral composition is studied
- schlich analysis is held
- Gofitsky deposit was evaluated from the financial and economic point of view
- profitability was identified and its attractiveness was estimated for potential investors.