



## TAILINGS MANAGEMENT FACILITY

A Tailings Management Facility (TMF) is a complex of special hydraulic structures and equipment designed to contain wastes from processed mineral resources called tailings. What the TMF contains is crushed rock with chemical admixtures formed as a result of a gold recovery process. No tailings at Kumtor contain radioactive elements.

*With gold recovery at Kumtor averaging 80%, the TMF contains approximately 65 tonnes of gold, according to preliminary estimates. Thus, with the proper technology, the tailings could be reprocessed, allowing for further gold recovery.*

Regular monitoring is carried out to ensure safe operation of all TMF components for which purpose 210 various control instruments are used. Along with the government bodies of the Kyrgyz Republic, the company's own ecologists monitor 42 quality parameters of treated industrial effluents. KGC cares about the environmental health and maintains the safety and environment standards of the Kyrgyz Republic and Canada as well as the World Bank requirements.

## ENVIRONMENTAL SAFETY

Kumtor considers responsible environmental management an important part of its business and spends approximately \$6 million USD per year on environmental assessment and management. This includes maintaining a department of nearly 25 dedicated full time environmental staff, and on-site and regional monitoring of water, air, biodiversity, soils & sediments, radiation and waste. The Company attaches great importance to conservation of the region's biodiversity and has worked with stakeholders concerned about

nature conservation since the start of operations, including contributing to the creation of the Sarychat-Eertash Nature Reserve (SCER), established in 1995. Most recently, Kumtor has partnered with Fauna & Flora International – the world's longest established international conservation body – to support biodiversity conservation projects within the SCER. Kumtor is proud of its support in this area, and since mining started, regional wildlife numbers of key species such as the snow leopard and Marco Polo sheep have increased.



## MARSHALLING YARD IN BALKYCHY

Because of the quantity and size of the materials and equipment needed to operate the mine, most things used at Kumtor are transported via railroad. However, due to its

remote location the mine is separated from the nearest railway by 160 km of highway and 90 km of dirt road that winds through the mountains.



The marshalling yard in Balykchy is the last stop for the railroad. Here special machinery is used to unload shipping containers from railroad carts and onto company trucks, which, escorted by security vehicles, then haul the cargo up to 4,000 meters above sea level by road.

Each year more than 150,000 tonnes of cargo pass through the yard in Balykchy to ensure the uninterrupted operation of the mine. The supplies used by Kumtor are provided by around 800 international and 700 domestic companies.

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## PRODUCTION PROCESS DEPOSIT

**Kumtor, one of the highest gold deposits in the world, is situated in the southern region of the Central Tien-Shan at an altitude of 4,000 meters above sea level in a permafrost zone. The deposit is located 350 kilometers from Bishkek, the capital of the Kyrgyz Republic.**

**The name of Kumtor Gold Project comes from the River Kumtor in the upper reaches of which significant gold reserves were discovered. While geological surveys in this area have been under way since the 1920s, the deposit itself was not discovered until 1978.**

## 2015 OUTLOOK

**At Kumtor, 2015 total capital expenditures, excluding capitalized stripping, are forecast to be \$75 million.**



Daniel Desjardins, President of Kumtor Gold Company, commented on the 2015 outlook as follows: "At Kumtor this year, we are expecting relatively even quarterly gold production as compared to prior years when the majority of the ounces were produced in the fourth quarter. The Kumtor mine is expected to produce between 470,000 and 520,000 ounces of gold, or 14.6 and 16.2 tonnes of gold in 2015."

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## HISTORY

'78	An expedition from the Kyrgyz State Geological Committee discovers the Kumtor deposit.
'89	The USSR Geology Ministry publishes the results of the detailed exploration of the Kumtor deposit.
'92	Cameco geologists travel to the CIS in search of promising deposits.
'92	The Government of Kyrgyzstan and Cameco Corporation sign the Master Agreement forming the Kumtor Gold Project.
'93	Kumtor Operating Company is formed as the project operator. The feasibility study is finalized.
'94	Construction at Kumtor begins.
'95	The initial financial package necessary for getting credits is completed and approved.
'96	The gold mill is inaugurated.
'97	Commercial gold production begins.
'98	One million ounces of gold is produced.
'02	Gold production at Kumtor exceeds 100 tonnes (3.2 million ounces).
'04	Project restructuring. Centerra Gold Inc. is formed. The Investment Agreement comes into effect (June 22, 2004).
'05	Based on exploration results, the Kumtor mine-life is extended till 2013.
'06	95 million USD are invested in the Kumtor modernization program.
'09	Parliament of the Kyrgyz Republic signed and ratified the Agreement on New Terms for the Kumtor Project.
'10	196.7 million USD are invested in the Kumtor production development program.
'12	A record-breaking 370 million USD are invested in the Kumtor production development program.
'12	Based on exploration results, the Kumtor mine-life is extended till 2023, and the period of ore treatment at the factory until 2026.



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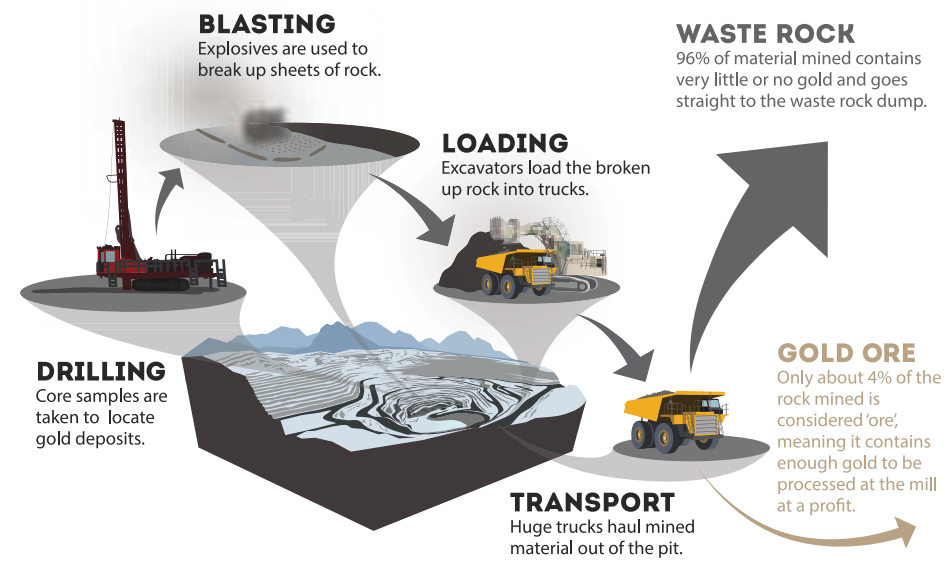


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# MINING PROCESS

Gold ore at the Kumtor deposit occurs mostly as fine gold particles embedded in pyrite. This ore is extracted using standard open-pit mining techniques, where rock is drilled and blasted in large strips. The blasted rocks can now be loaded unto large trucks using excavators and transported out of the pit.



Kumtor mine is outfitted with the latest mining machinery available. The fleet includes 103 Caterpillar trucks, each with the carrying capacity of 145-185 tonnes, 8 boring rigs, and 14 excavators that run faultlessly. Besides these, there are 14 bulldozers and 11 blade graders which maintain the roads and other infrastructure of the mine. Workers are transported to and from the mine using KAMAZ trucks, popularly referred to as crew buses.

## DRILLING



Drilling plays an essential role in extraction of precious metals. Before any major work can begin on a given section, geologists must have a precise idea of the average gold grade in the ore. Based on the drilling data they will then decide whether to process the ore at the mill, or haul it to a waste rock dump, if the gold content is too low to make a profit.

The mine's boring rigs can drill to a depth of up to 12 meters, with an average drilling speed of 1,600 rotations per minute. An average of 1,000 holes are drilled during one shift. In addition

to determining the gold content, these holes also serve as the first step in the blasting process.

## BLASTING



Blasting is used to break up large sheets of primary rock. Rock in the permafrost zone is extremely hard which makes it impossible to load or transport without breaking it up first.

When the geologists decide on a blasting location, the entire zone is closed off. A grid of several dozen holes is drilled in that block of rock and filled with explosives.

Occupational health and safety compliance during the blasting of a section is of paramount importance for all employees involved in the mining operation. Before any explosives are detonated, the security service makes an announcement and all machine operators are required to vacate the mining pit before blasting can proceed.

## LOADING



After the roads on the blast site have been cleared, excavators come to load the blasted rock unto trucks. There are two types of excavators working on the mine, the largest of which are five Hitachi EX3600-6 excavators.

## TRANSPORTATION



In order to get at the gold ore, large sections of rock that contain little or no gold also need to be removed. This was 'waste rock' is hauled to designated waste rock dumps and unloaded there. Trucks transporting gold ore on the other hand go to the mill. Here the ore is ground down to a fine powder and is transported to the factory by a conveyor belt.

# FACTORY

The ore is delivered to the crusher and then to the mill, where gold is extracted using carbon-in-leach technology. For more effective ore processing an ultra fine grinding mill (ISA Mill) was installed in the factory in 2005. It grinds ore down to 20 microns, which is about one fifth of the diameter of a human hair.

The mill's rated through put equals from 16,000 to 17,000 tonnes of ore per day. The entire production process is automated involving just 16 people per shift to operate the entire factory.

After the gold extractions is complete, the gold is smelted into Dore bars, which contain up to 80 percent of gold.

*The Doré bars produced by the Kumtor mine are purchased by Kyrgyzaltyn JSC for processing at the Kara-Balta refinery pursuant to a Gold and Silver Sales Agreement signed by KOC, Kyrgyzaltyn and the Government of the Kyrgyz Republic. Kyrgyzaltyn JSC enjoys the exclusive right to sell refined gold and silver both in- and outside the Kyrgyz Republic.*

