

## **THE LARGEST OPEN PIT MINES IN THE WORLD**

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The prosperity of the country and people is based on the development of heavy industry and one of its leading branches, mining industry, which supplies the national economy with fuel and raw materials. The world of today could not exist without minerals. Extraction and transportation of the minerals would be impossible without mining equipment. The aim of this work is to tell about the places where these machines operate: the largest open pit mines in the world.

The deepest diamond open pits are located in Russia. Udachnaya pipe is a diamond deposit in the Daldyn-Alakitkimberlite field in Sakha Republic. The nature of this unique mineral, the topography and general severe conditions, capital investment and engineering determine the methods of excavation and the selection of the machines.

Udachnaya is an open-pit mine which is located just outside the Arctic circle. It was discovered on June 15, 1955 by the Russian geologist Vladimir Shchukin and his team. It is more than 600 meters deep, and it is considered to be the 3rd deepest open-pit mine in the world. The nearby settlement of Udachny is named after the deposit.

As for 2010, Udachnaya pipe is controlled by Russian diamond company Alrosa, which plans to halt open-pit mining in favor of underground mining.



**UdachnayaPipe, Russia**

As the mining at Udachnaya open pit proceeded to deeper horizons, increasing tonnages of overburden were mined from the walls, adding considerably to working costs.

And recently the point has been reached where it is better to cease open pit work and continue to mine the deposit by converting it to an underground mining operation.

Open-pit mining calls for the use of modern excavating and transportation machinery and methods. Excavation involves a number of operations connected with loosening and breaking the rock by means of machinery or by drilling and blasting; such operations as loading, transportation and dumping are also of great importance. The problem of open-pit mining is economical and efficient handling of ore and of waste rock requires sufficient efforts.

Another diamond pit is located near the town Mirny. So called Mirny Mine is 525 meters deep and has a diameter of 1,200 m. It is the second largest excavated hole in the world, after Bingham Canyon Mine. The airspace above the mine is closed for helicopters because of a few incidents in which they were sucked in by the downward air flow.

The mine was discovered on June 13, 1955 by the Soviet geologists Yuri Khabardin, Ekaterina Elagina and Viktor Avdeenko during the large Amakinsky Expedition in Yakut Republic. The development of the mine was started in 1957 in extremely harsh climate conditions. Seven months of winter per year froze the ground into permafrost, which was hard in winter, but turned into sludge in summer. The winter temperatures were so low that car tires and steel would shatter and oil would freeze. The entire mine had to be covered at night to prevent the machinery from freezing. For this discovery, in 1957 Khabardin was given the Lenin Prize, which was one of the highest awards in the Soviet Union.

The largest diamond of the mine was found on 23 December 1980; it weighed 342.5 carats (68 g) and was named "The 26th Congress of CPSU". The Mir mine was the first and the largest diamond mine in the Soviet Union. After the collapse of the USSR, in the 1990s, the mine was operated by the Sakha diamond company, which reported annual profits more than \$600 million from diamond sales. Currently, the mine is operated by Alrosa, the largest diamond producing company in Russia that employs 3600 workers.



**Mir Mine, Russia**

But there are also two very deep and big open pit mines in the other parts of the world.

The Bingham Canyon Mine is an open-pit mining operation extracting a large porphyry copper deposit southwest of Salt Lake City, Utah, USA. It is the deepest copper

open-pit mine in the world. Minerals, in the form of copper ore, were first discovered in Bingham Canyon in 1848 by two brothers, Sanford and Thomas Bingham. The mine has been in production since 1906, and has resulted in the creation of a pit over 1.2 km deep, 4 km wide, and covering 1,900 acres (7.7 km<sup>2</sup>). According to Kennecott, it is the world's largest man-made excavation and is visible with the naked eye from space. It was designated a National Historic Landmark in 1966 under the name Bingham Canyon Open Pit Copper Mine. Today, as the second largest copper producer in the United States, Kennecott Utah Copper provides about 13-18% percent of the U.S.'s copper needs. It is one of the top producing copper mines in the world with production of more than 18.7 million tons. Every year, Kennecott produces approximately 300,000 tons of copper, along with 400,000 ounces of gold, 4 million ounces of silver, about 20 million pounds of molybdenum.



### **Bingham Canyon Mine, USA**

Chuquicamata, or "Chuqui" as it is more familiarly known, is a large open pit copper mine in the north of Chile, 215 km northeast of Antofagasta and 1,240 km north of the capital, Santiago. The mine has total production of approximately 29 million tons of copper to the end of 2010. Despite over 90 years of intensive exploitation it remains one of the largest known copper resources. Its open pit is one of the largest in the world with 4.3 km long, 3 km wide and over 900 m deep and its smelter and electrolytic refinery are among the world's largest.

Special equipment is necessary for operating on these open pit mines and only mining machines can provide required efficiency. Large dump trucks, excavators and draglines are got wide application.

There are a lot of different open pit mines in the world. Each of them supply country with useful minerals and give opportunity to stabilize economy. So it is very important to develop new deposits of ore and extract as much as possible.