A new environmentally friendly container technology has been developed at quarry dumps

The development of deeper horizons of the quarry requires an increase in the work of the quarry transport. The high concentration of transport equipment and the tightness of spatial parameters increases the environmental burden on the environment. The low stability of the deposited rock of the dump requires constant monitoring of the laying of roads and railways. The storage of quarry rock mass in the form of external dumps over large areas also causes significant damage to the ecology of the region.

Introduction

The operation of mining equipment on dumps with existing technologies causes a number of environmental and technological problems: high gas contamination, moving equipment near the prism of a possible rock collapse, etc.

The scheme of dumping in container technology

It is proposed to use container technology for transporting the laying rocks in the dump, where the main element of the technology is a mobile lifting machine, which eliminates the need to build roads or railways on board and on the surface of the dump.

Results

According to the new technology, the amount of work will be completed thanks to 1 lifting machine.

Increasing the height of the dump from 40 meters with traditional technology to 80 meters with a new method of dumping will reduce the area occupied by dumps by 175,000 m² per year:

\[ H_{by2} = L_c \cdot \sin(\beta) + h - h_{kr} \]

The intensity of dust emissions from domestic sources will decrease by 1,576 tons per year.

A decrease in dust emissions is also observed with an increase in the height of the dump due to a decrease in area, with a difference of 75.57 tons per year.

The total reduction from container technology will amount to 1,651.57 tons per year.