

ing natural area. Reconstruction of the natural area, in its turn, carries the information about the landscape and the climatic conditions.

Speaking of landscape trends, reconstructed according to the remains of amphibians and reptiles, we can say that in the Pleistocene constant change of natural zones for the entire interglacial stages occurred. This conclusion does not contradict the data of palynological research. However, it should be noted that, as the pace of evolution of amphibians and reptiles is quite slow, detection of assemblages consisting only of modern species is not an indicator of their young age and a detailed division of the Late Cenozoic sediments on such paleontological basis is impossible, but it allows us to speak about certain climatic rhythm fauna exists within.

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## **INFLUENCE OF CEMENT INDUSTRY ON THE ENVIRONMENT**

Modern industrial production has a significant impact on the environment on a global scale. Contamination of the environment by industrial emissions has a negative impact on human health and on the environment as a whole. Today in the CIS countries, there is a rapid development of the industrial production of cement, dry mixes, concrete and concrete products, which in turn has not the most favorable impact on the environment, and even in Western countries, where there is a strict law on nature protection, the problem is very serious.

The production of cement is based on the use of non-renewable raw materials. The enterprises of the cement industry to the environment are allocated annually more than 27 million tons of dust. They account for 2/3 of the industrial emissions of solids and 44% gases.

According to CPCB (*Central Pollution Control Board*) cement industry is one of the 17 most environmentally damaging industries.

This production activity is a significant factor constraining development of the industry both in terms of environmental and economic costs and regional environmental constraints. This requires the integration of environmental factors that influence the formation of the cost of production, starting with the mineral extraction phase and ending with the production, transportation and use in the construction of the finished product. Among requiring consideration of environmental problems should be allocated associated with exposure to specific ecosystems:

1. Air pollution is generated by emissions from industrial processes:

- in the cement industry: cement dust emissions; gaseous emissions, including CO<sub>2</sub>, which according to researchers in the construction industry makes up 25% of all global emissions of industrial production; fast evaporating emissions from smokestacks components;

- during the extraction of mineral raw materials: dust emissions from mining and primary processing of the rock mass; specific gaseous emissions from blasting, dust emissions from the waste dumps;

- during the transport of raw materials and finished products: emissions of pollutants from the operation of vehicles.

#### 2. Rejection and violation of land:

- during construction and operation of a plant for the extraction of minerals: mining allotment, land transport and communication infrastructure, the formation of heaps;

- when placing the cement production facilities and creation of sanitary protection zone.

#### 3. Pollution of the hydrosphere:

- during construction and operation of a plant for the extraction of mineral raw materials: the formation of depression cones due to water pumping (the area of craters can be up to 200-300 km<sup>2</sup>);

- breaching of the hydrogeological regime, pollution of groundwater and surface water with complete degradation of rivers due to siltation and erosion of coasts, excess levels of water contamination;

- during the production of cement - water use and wastewater discharge.

#### 4. Violation of subsoil during construction and operation of a plant for the extraction of mineral raw materials, characterized by violation of the integrity of the rock mass, withdrawal and loss of adequate resources.

Considering negative impact which is made by the cement industry on the environment, can be the main directions of greening: reduction of volumes of emissions by catching and utilization of dust, use of thermal energy of flue gases, alternative materials and fuel and others.

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## **ASSESSMENT OF ABSORBED DOSE FROM IONISING RADIATION USING ELECTRON PARAMAGNETIC RESONANCE**

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Electron paramagnetic resonance (EPR) dosimetry is a physical method for the assessment of absorbed dose from ionising radiation. It is based on the measurement of stable radiation induced radicals in human calcified tissues (primarily in tooth enamel). EPR dosimetry with teeth is now firmly established in retrospective dosimetry. It is a powerful method for providing information on exposure to ionising radiation many years after the event, since the 'signal' is 'stored' in the tooth or the bone. This technique is of particular relevance to relatively low dose exposures