

However, the most important health impact of coal mining is black lung disease [1]. Despite all recent improvements and inventions, this occupation is still the most dangerous one as it regularly kills over 100 men per year in the Russian Federation.

The most widely discussed ecological problem related to hydrocarbon production is oil spills. Despite the great amount of money spent on further clean-up, nevertheless, many of the beaches have been completely destroyed and numerous species of marine animals suffered a great damage.

Accidents on land can also spill oil into the oceans. The most spectacular case of this type was in Campeche Bay, Mexico, in 1979, where a well could not be capped for 280 days, during which it spilled 700,000 tons of oil into the Gulf of Mexico, doing heavy damage to aquatic life.

Oil spills or leaks can occur not only in marine environment, but also on land. The consequence of on-land oil spill is the formation of aesthetically objectionable landscape [3]. Above all, hundreds of villages, settlements have been eliminated due to the oil exploration.

In conclusion, it can be stated that there should be great social and environmental concern when petroleum and mining industry contaminate the water and land resources that the population depends on. Although more attention needs to be placed on damage that is done to the wildlife. Pollution that directly influences the health of human beings must be immediately dealt with. The government should elaborate not only the corresponding environmental regulations, but also the system of penalties and monitoring system for irresponsible mining and petroleum companies.

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RECYCLING OF PLASTIC WASTE

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Nowadays, industrial activities are in exponential increase, which has a negative impact on the environment. One of the environmental unfriendly factors is various types of industrial and commercial wastes, which accumulation pollutes the environment. Plastic items production is a bright example. The high-priced metals are replaced by plastic material due to its low cost and ease in use. Plastic material is widely used in different industries such as instrument and mechanic engineering, and medical equipment industry. Such items as cases, panels, and component parts are mostly plastic. In 2000, world plastic production exceeded 220 million tons per year. 40% of the capacity is used for package material, almost 30% - production of membrane, 5% - for furniture industry, and 3% - for engineering. The rest 22% is used in construction as a material for multilayer coatings and interior work [5, 6].

Plastic waste disposal has been of a global character since 1990. The main source of plastic wastes is mostly domestic wastes (about 70%), trade and industry (a bit less than 20%), agriculture and construction (3-5%), and even transport (up to 6%). [5] Plastics are not exposed to decomposition and corrosion, so it is difficult to destroy them. However, being direct plastic utilization, plastic waste burning, though in special installations, can release harmful toxic emissions into the atmosphere. Therefore, plastic recycling is considered to be much more environmental friendly and beneficial process.

Recycling is a return of many materials which are contained in the waste industry, construction and domestic sphere to the industrial production. There are several ways of plastic waste recycling [1, 3]:

1. Recycling of industrial technology;
2. Pyrolysis and incineration with municipal solid waste;
3. Use of plastic waste as a material for other processes;
4. Ground disposal in landfills and dumps.

The most effective method of disposal is recycling of plastics for industrial technology. This method is divided into several stages: The first step is separation of non-plastic components, such as cardboard, paper products, wood, and metal items from plastic ones with further segregation.

The second step is shredding of plastic wastes to the required size (sometimes it is done several times). The third step is washing and cleaning the crushed waste. The fourth step is plastic waste separation according to different types of plastic. There are two cases: if it is the wet method, first comes classification of waste produced, and then drying; if it is the dry methods, at first ground waste is dried and then classified. The dried waste is pelletized with stabilizers, colorants, and fillers. The granulated material is processed and a product is made at the final stage. This processing method is very time-consuming and expensive, so, steps 3-5 are sometimes excluded from the process.

Another important technique of plastic waste recycling is using it as a material for production process. If plastic waste is used in construction material production, such technology is tolerant to presence of some non-plastic wastes. This method of processing does not require plastic to be separated, sorted out and cleaned [1]. In this case, plastic waste is recycled through hot shaping. Plastic waste is mixed with a binder solution or hydrated gypsum. Such solutions can be applied to coating, blocks, panels, and cladding material. Pavement can be produced by mixing the bitumen and thermoplastic waste, mineral oil or excipients. Thermal methods are used when it is impossible to dispose waste or find their practical application. Pyrolysis is oxygen free (burning) recycling of plastic waste.

This method is completely safe, as there are no emissions into the atmosphere in this case. Pyrolysis is carried out in several stages: 1) The top of the reactor pyrolysis plant receives solid domestic waste, which descend below through superimposed retort. In the upper layers of the reactor the raw material is dried and fed into the reactor itself. Thereafter, the crude product is delivered to the reactor, and pyrolysis process takes place. Post-consumer recycled waste is in the lower part of the reactor and discharged to the outside. Result of pyrolysis is the organic complex compound structures which are simple, non-toxic liquid, gaseous or oily. These compounds have no fixed melting point: they are broken down and then melted. Fusion time is up to tens of minutes. Temperature determines the speed of the process depending on the crude product.

The disadvantages of dumping of wastes are significant waste disposal costs for waste transportation. For dumping there should be a large amount of available lands. The

downside of this process is the spread of infection, contamination of ground water and the atmosphere, fires.

People around the world have long recognized that throwing trash is uneconomic, because the garbage is potentially raw. In some European countries, there is the law of separate waste collection, which greatly helps to cope with such a serious problem as waste. For Russia, the recycling of waste polymers is new; everything is just beginning to develop. However, in many cities there are already some plastic processing plants. For example, the Moscow Company "Eco-System" has been cooperating with many cities in Russia and produces disposition of garbage. In Tomsk, there are also collection points of plastic waste [2]. After collecting the waste polymers from the population, the garbage is sent for processing to the chemical industry specialized in the production of polystyrene. Nevertheless, this is just the beginning of the process; at present plastics processing becomes very relevant [4]. When we take recycling, we not only recycle the waste industry, but also save environmental resources. Recycling of plastic waste is much safer and more efficient than burning or burial. Raw materials, which are produced during the recycling, can be used in many industries. Sooner or later, the recycling of plastic waste will contribute to the improvement of ecological climate, increase in the number of business companies, both small and medium ones providing new opportunities for employment experts, the preservation of not only environment, but also Russia's energy resources.

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CURRENT ISSUES IN ECOLOGICAL MONITORING

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The modern term "monitoring" refers to observation, analysis and assessment of environmental conditions, its changes under the influence of human economic activity, as well as prediction of these changes. Testing results on a destructive action of water, wind, earthquakes, avalanches, etc., people have long realized the elements of monitoring, accumulating experience in weather forecasting and natural disasters. Such knowledge has always been necessary in order to reduce possible damage to human society and natural hazards, most importantly, reduce the risk of human losses.