

ANALYSIS OF INORGANIC POLLUTION OF THE INDUSTRIAL AREA IN BRANICEVO DISTRICT, THE REPUBLIC OF SERBIA

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Abstract

Intensive mining of fossil fuels has caused the exhaustion of nonrenewable natural resources, water, and air pollution, and significant deterioration and degradation of soils. One of the main problems associated with electricity generation from coal combustion is the “energy waste” issue. When analyzing the potentially harmful environmental impact it primarily applies to the heavy metals. Heavy metals accumulate in the soil due to natural lithogenic and pedogenetic processes and anthropogenic factors. The city Kostolac belongs to the group of more polluted cities, especially by heavy metals, as well as air sulphur and nitrogen oxides. This paper aims to determine the impact of Power Plants and Mines Kostolac, on the quality of soil, water and ambient air in the surrounding environment. A multivariate technique has been applied to a data set to determine the contribution of different sources. As for heavy metals such as lead, cadmium and mercury whose concentrations exceeded the limit values in almost all Kostolac soil and water samples, the investigations suggest that apart from ash other sources may be responsible for this contamination, motor vehicle traffic on the roads in the surroundings of the subject area. Also, the investigations have identified agricultural activities as another significant source of contamination, (in the case of Hg) which is due to the use of fertilizers and heavy-metal pesticides that take place in the near farmstead. In the case of arsenic and zinc, only local contamination has been detected. The results of the chemical analysis showed that the surface water in the area near the power plant complex Kostolac is generally of chemical quality suitable for domestic or agricultural use at most of the tested locations. The samples containing slightly higher values than the allowed standards set fall thus into contamination and these samples may not be suitable for human consumption. It was found that the main principal components extracted from the air pollution data were related to traffic activities and coal combustion.

Keywords: power plant, air pollution, water pollution, soil pollution, heavy metals, multivariate technique.