



Estimation of prevented environmental-economic damage in case of utilization of ferroalloy production waste

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In recent years the more and more attention spent on detailed assessment of natural resource potential and environmental situation in regions [1,2]. According to conception of sustainable development, it is necessary to evaluate environmental influence economically. The one of most used method is to calculate values of ecological and economic damage, and particularly a prevented environmental-economic damage [3]. The principle of prevention but not compensation is the basis of conception of prevented damage. Prevented environmental pollution damage is an estimate in monetary terms of the possible negative effects that could be avoided as a result of a set of measures to protect the environment.

Estimation of prevented pollution damage value is based on region indexes of specific damage, which are representing specific damage valuations on unit (1 notional ton) of effective mass of pollutants [4]. We have studied lake of ash-sludge storage of Aksu ferroalloy plant (Aksu, Kazakhstan). In order to calculate sum concentrations of every element we have performed integral calculations of all elements concentrations in every point of the whole area of waste lake based on work of neural network as well using methods of interpolation and extrapolation. We have calculated the sum mass of waste which is approximately equal to 40435451 ton.

We have estimated sum prevented damage after performing of measures to protect the environment according to the formula:

$$Y_{prev} = Y_{spec} \sum_{n=1}^L M_i \cdot K \cdot J$$

Y_{spec} – index of specific damage value from pollution with 1 notional ton of pollutant. M_i – effective mass of pollutants eliminated as a result of environmental protection. K – factor of environmental situation and environmental significance. J – deflator by industrial sectors. Thus, we have calculated value of prevented environmental-economic damage for the studied object, which is equal to 7 288 894 KZT (on 0.001% utilized).

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[2] I.E. Suleimenov, G.A. Mun, I.T. Pak, S.B. Kabdushev, Z.A. Kenessova, E.E. Kopishev. News of the National Academy of Sciences of the Republic of Kazakhstan, Series of Geology and Technical Sciences. 423 (2017) 198–205

[3] O.V. Grigorieva, D.V. Zhukov, A.V. Markov, V.F. Mochalov. Sovremennye Problemy Distantionnogo Zondirovaniya Zemli Iz Kosmosa. 15 (2018) 233