

Название: Assessment of Metals Pollution from Tailing Sites in the North Caucasus Region, Russia

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Источник: MINE WATER AND THE ENVIRONMENT **Том:** 37 **Выпуск:** 4 **Стр.:** 815-824 **DOI:** 10.1007/s10230-018-0545-x **Опубликовано:** DEC 2018

Аннотация: The concentrations of metals were determined in the water and bottom sediments of both the Urup and Kuban Rivers near tailings sites in the North Caucasus region of southern Russia. The average concentrations in the Urup followed the order Fe > Mn > Pb > Cu > Zn > Cd > Ni > Co, while in the Kuban, the order was Fe > Pb > Zn > Ni > Mn > Cd, with copper and cobalt not detected. The levels of Zn, Cu, Pb, Cd, and Ni were above Russia's maximum permissible concentration in both rivers. The water pollution index (WPI) values in Urup ranged from 12.97 to 28.17, indicating that the river is extremely polluted (Class VII), while the WPI value for Kuban ranged from 2.34 to 4.33 downstream of the tailings site, which corresponds to Class IV (contaminated). Calculating the coefficient of accumulation in sediments (CAS) revealed that in Urup, the CAS values for Ni and Cu were 3046 and 11638, respectively, which indicates an emergency environmental situation, while for Co, Fe, and Mn, the situation is high level chronic pollution (CAS > 10(4)). The Kuban CAS values of Fe and Mn were also > 10(4), again highly and chronically polluted. Most of the metals in both rivers are bound to the sediments, with minimal mobility. The potential ecological risk is moderate to considerable in Urup, and low in the Kuban River.

Идентификационный номер: WOS:000452928800018

ISSN: 1025-9112

eISSN: 1616-1068