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ASSESSMENT OF WATER QUALITY RELATED TO LEAD/ZINC MINES IN UMURBEY DAM BASIN, NORTHWESTERN TURKEY

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Abstract: The purpose of this study is to determine hydrochemical properties of the water resources and to assess the potential environmental consequence of the mining activities in Koru and Tesbihdere lead/zinc mine districts, and investigate detrimental effects caused by mining activities on the water resources and sediment quality in Umurbey dam basin (Biga Peninsula, NW Turkey). Cadmium, Cu, Fe, Mn, Pb and Zn concentrations in sediments downstream of Tesbihdere and Koru mines and in Umurbey dam sediments are higher than average values of world river sediments. The chemical analyses revealed that Fe, Zn Pb and Mn concentrations of a total of water resources (spring, surface water, groundwater and waste pool) reached to 2890 µg/l, 1785 µg/l, 1180 µg/l and 984 µg/l, respectively. Manganese concentrations of water samples collected from Umurbey dam was measured 584 µg/l. The metal discharges from Pb/Zn mines on Koru riverbed were huge, and Koru river was classified as polluted water (class III) according to Turkish inland water quality regulations. Leakage from flotation slurry deposits in Umurbey dam basin may pose long-term risk for environmental health.

Keywords: lead/zinc mine, water resources, water quality, Umurbey dam, heavy metal