Abstract

Heavy metals are special groups of contaminants in the water reservoir affect environmental quality by accumulating in sediments and resulting in serious human health hazards. Heavy metals contamination in the water reservoir has led to increasing concerns in recent years. The present study investigated the extent of heavy metals pollution in Chahnimeh 1 reservoir water and bottom sediments. Chahnimeh1 reservoir is located on the Sistan region that is a part of series of natural depressions used primarily to store water for irrigation and public water supply. They are not only used to store water but also have profound impact on prevent floods. 229 sampling sites along Chahnimeh 1 resevoir were selected for the analysis of surface sediments. Concentrations of five heavy metals were examined from the water and bottom sediments. Samples were analyzed for the regional variability for the concentrations of Fe, Mn, Ni, Pb and Zn using AAS. Mean average of metal concentrations were Fe: 19717, Mn: 970, Ni: 61, Pb: 23 and Zn: 100 mg Kg^{-1} in the sediments. According to the results of water samples, average of all physical water quality parameters including EC(Electrical Conductivity), TDS(Total Dissolved Solids), T(Temperature) and pH has been seen drinking water quality criteria. The concentrations of heavy metals Ni, Pb and Zn met the optimal level of the drinking water and the amount Fe and Mn exceeded the maximum permissible level. In order to determine the significant relationship and similarities and differences among sampling sites, concentration data of the above mentioned elements were analyzed statistically and geo-statistically by using Pearson correlation analysis and ArcMap software, respectively. The results showed that all heavy metals had significant relationship among each other that indicated the source of all heavy metals were the same. Limitation of water resource in the province and attention to this point which drinking water of this area were supplied from the Chahnimeh1 reservoir, determination of pollutants levels in the environment were necessary.

Keywords: Bottom sediment, Chahnimeh 1 reservoir, Heavy metals, Water quality

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Assessment of heavy metals contamination (Fe, Mn, Ni, Pb and Zn) in bottom sediment and it is impact on water quality (case study Chahnimeh 1 reservoir in Sistan)

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