POLLUTANT MATRICES OF SELECTED HEAVY METALS IN THE PASIG RIVER SEDIMENTS, METRO MANILA, PHILIPPINES

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Iron and manganese oxide (moderately reducible phase) is the dominant controlling matrix for heavy metals in the sediments of the Pasig River. In decreasing order, the general occurrence of metal species trends as follows: residual moderately reducible exchangeable organic fraction and sulfides carbonates and easily reducible. The residual fraction comprises lattice-bound metals and is not a significant matrix of heavy metal pollutants. Transformation of heavy metal concentrations into Müller's Index of Geoaccumulation reveals environmentally critical zones of heavy metal pollution coincident to sectors of intense industrial activities along the river. Zones of extreme metal pollution are characterized by indices: 6 (excessively polluted) for Ni and Cd; 4 (strongly polluted) for Zn and Pb; 3 (moderately to strongly polluted) for Cu and Mn; and 2 (moderately polluted) for Co and Fe. Waterways and other feeder channels serve as conduits for point-source metal discharges; and as pathways for metals derived from run-off in areas farther from the river.