



The impact of oil seepages and municipal wastewaters on Tembi River sediments, Masjedsoleyman (SW Iran)

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Oil seepage in Masjedsoleyman oil-producing region and urban and industrial effluents discharge into the main stream of Masjedsoleyman and eventually into Tembi River has polluted this river. The water of Masjedsoleyman main stream is used for livestock drinking and Tembi River is famous as a tourist site and camping. In this study, ten sampling stations were chosen along the main stream of Masjed–soleyman and Tembi River. Heavy metal concentrations (Zn, Ni, Cu, Cd, Co, Cr, Pb, Fe), carbonate content, texture, pH, total petroleum hydrocarbon (TPH), total organic carbon (TOC) and free hydrocarbon(S1) in sediments samples were analyzed using ICP-MS, GC-MS and Rockeval 6. In order to determine the most important transporting phase in the sediment, Tessier sequential extraction is used. Correlation between metals and petroleum hydrocarbon and physical properties of sediment, probable source and spread of pollution are discussed. The concentration of contaminants is compared with threshold effect concentration (TEC) and probable effect concentration (PEC). Contamination factor (CF) has been calculated to assess the degree of pollution in sediments. Enrichment factors illustrate maximum enrichment of metals in sediments of Dare Khersan of Masjedsoleyman stream. Sequential extraction analysis shows iron, chrome, copper and zinc accumulate mainly in residual phase. In the majority of sediment Pb occurs in the organic fraction. Cd in sediments appears mainly in the exchangeable fraction, followed by the Fe-Mn oxides and residual fractions. The bioavailability of heavy metals decrease as Cd> Ni> Co> Pb> Cr> Zn> Cu> Fe. This study shows that the major source of heavy metals is the discharge of municipal sewage but the source of Ni is the oil seepages. Comparing the heavy metal concentrations with the consensus–based TEC and PEC values revealed that some metals such as Cd, Cr, Ni and Zn in some sediment samples are higher than both TEC and PEC, values