



Heavy metal distribution in “La Encontrada” mining pond in Cartagena-La Unión (Spain)

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Throughout more than 2000 years, metal mining activities were carried out in Cartagena-La Unión Mining District (SE Spain), and many ponds were built such as “La Encontrada”. These mining ponds are exposed to very intense erosion processes related to the semi-arid climate conditions. Therefore, high heavy metal contents found in diverse ponds constitute a potential source of pollution for the environment. In order to analyze the environmental risks associated to “La Encontrada” mining pond, total, DTPA- and water-extractable Pb, Cd, Zn, and Cu contents were measured through three different samplings. The first one consisted of a surface sampling of the top flat plain, the second sampling was made by a core drill to determine heavy metal distribution in depth, and the third one was a soil profile. Results showed high total concentrations of Cd, Pb and Zn in surface and depth samples, as well as in soil profile horizons. DTPA- and water-extractable values showed that Pb and Zn were the most mobile and bioavailable elements. Considering soil heavy metals threshold levels established by the Dutch legislation, almost all surface soil samples and soil profile samples could be considered as polluted, excepted for Cu. Moreover, samples in depth could be classified as polluted due to the high contents of Cd, Pb and Zn. Cadmium, lead and zinc contents found in “La Encontrada”, allow to conclude that this mining pond is polluted and, as a consequence, there would be zones which possess the highest potential risks associated to heavy metal run-off and leaching; erosion and accelerated oxidative processes may also affect metals transport.