

THE ROLE OF GEOCHEMICAL PROCESSES IN THE RETENTION OF HEAVY - THE CASE OF A LEAD SMELTER CONTAMINATED SITE.

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The inadequate disposal in the soil of 490.000 t of slag, contaminated by heavy metals, produced by the Plumbum Mineração and Metalurgia Ltda lead smelter, in Santo Amaro da Purificação, Bahia State, Brazil, from 1960 until 1993, contaminated the soil and the waters and reached human targets, especially children resident in the neighbourhood. Researches for remediation of the site were carried out in a pilot area through the characterization of soil, surface and groundwater. The soil, developed over shale, is very clayey and is classified as a vertissol. The assessment of the contamination was accomplished by means of quantitative chemical analysis for lead, cadmium, pH, organic matter content (OM), cation exchange capacity (CTC) and soil texture. The analysis of physical-chemical parameters showed that interactions among the pollutants, water and soil, resulted in the retention of the metals. These were found in the superficial soil layers, but not at depths over 2m. Groundwater showed relatively low lead concentration, but the levels are above those established by drinking standards. Surface waters present high metals concentration, but the existence of a wetland downstream acts as a retention pond. The most important geochemical processes are: (i) precipitation of the metals in the wetland; (ii) metals adsorption in the superficial soil layers, due to high OM percentage, high CTC, alkaline and clay contents; (iii) complexation developed due to high OM and CTC in the superficial soil layers. Such characteristics suggest that the contamination is restricted to an apparently reduced area.