



Differential geomorphological characters of mining residua piles in relation to their age, composition, granulometry and morphological array.

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Mining residua accumulate in some areas, producing varied effects on the surrounding areas, including a diffusion of their potentially toxic components into farming areas. In detail, this possibility is controlled by different factors, including climatological/meteorological features, supposing different distribution arrays; and of course, including the characters of the residua, acting with differential mobility, after a number of parameters involved on such mobility.

In order to assess the potential of intrinsic factors, a survey has been carried out in the decommissioned mining area of San Quintín, located in South-Central Spain. This is an area that supported mining activity during the 20th Century, aimed to obtain lead with high silver contents during the mining works (mainly, between 1889 and 1934), and lately, for Zn (between 1973 and 1988, after the mine closure, on the basis of processing of residua piles). The mine activity here produced two very different tailing deposits: “old tailings”, chaotic and heterogeneous deposits corresponding to early concentration procedures, and “modern tailings”, homogeneous and sandy deposits related to more efficient froth flotation treatments.

The geomorphological study of the area has included both the influence of water and wind related erosion and transportation. The old tailings of San Quintín, due to their material and granulometric heterogeneity, are mostly subject to runoff and fluvial erosion. The new tailing deposits, because of its uniform size particles, are mostly prone to aeolian erosion. A detailed landform inventory, and characterization and quantification of geomorphic activity has been made. Stabilization measures must combine chemical remediation measures with differential geomorphic stabilization: sustainable stable drainage networks and basins for the old tailings and appropriate regrading and covers for the new tailings.

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