Environmental assessment in the abandoned Hg mine site of La Campa del Trave (Asturias, Spain)

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The region of Asturias in northern Spain was an important mercury producer until the 1970´s when all mercury mines of the region were abandoned without restoration. In the context of this mercury mining district, the abandoned mine site of La Campa del Trave has been studied from an environmental point of view. This site is located in a rural area in the Nalon River catchment. The potential pollution associated with this abandoned mercury mine site is intensified by the presence of arsenic in the mineral paragenesis in the form of arsenic specific and non specific minerals (orpiment, realgar, arsenopyrite and As-rich pyrite). Currently, there are in this mining area the abandoned mine, remains of the metallurgical plant and spoil heaps containing wastes from the mine and from the pyrometallurgical plant. Mine water drainage from galleries is usually low (7 to 19 litre/sec) and pH can reach values lower than 3 units. A soil sampling network has been designed in the immediate surroundings of pyrometallurgical plant and mine wastes, tailings and soil samples were collected. For the purpose of the study a Field Portable X-Ray Fluorescence spectometry (FPXRF) has been used in the field and Inductively Coupled Plasma (ICP) and Flameless Atomic Absortion (FAA) equipments in laboratory. Results reach up to 912 mg kg^{-1} total arsenic, 6,9 mg kg^{-1} cadmium and 1396 mg kg^{-1} zinc, geochemical anomalies are very influenced by the topographic heights and hidrogeological flows increasing the metal concentrations in low heights and discharge areas. On the other side, Hg concentration reaches up to 4752 mg kg^{-1}, at the site of the more recent tailing deposits made during the end of the works. The wet climate of the areas is favourable for a great development of the vegetation that is producing a natural recovering of the spoil heaps by autochthonous plants and therefore an integration of the abandoned mine works in the landscape.

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