

GEOCHEMICAL AND ENVIRONMENTAL ASSESSMENT OF AN ABANDONED U- MINE

1 SANTOS OLIVEIRA, J.M. and ÁVILA, P. 1 Instituto Geológico e Mineiro, Lisbon, Portugal

An area around of the abandoned uranium Cunha Baixa Mine, in the centre of Portugal, was investigated. The mineralisation mainly comprises secondary U-minerals (torbernite and uraninite) and sulphides. Results from multielement chemical analysis carried out in stream sediments and alluvial soils reveal that U appears as the only element present over the area with significant concentrations for long distances downstream from the mine tailing site. Moreover, ^{226}Ra also seems to acquire some chemical (and environmental) importance. Average contents of 478 ppm of U in stream sediments and 36 ppm in soils are found in areas under the influence of the mine site. These were compared with some computed and reference baselines for the tailings, rocks and soils. The geochemical distribution model shows that contamination of sediments and soils resulting mainly from the mining operations is obvious. Multivariate analysis applied to the data (PCA, FA) also confirms the geochemical independence of the uranium in relation to the other heavy metals but one of the mathematical factors suggests the existence of a geochemical signature associated to supergenic U-phosphates. These results stress that the actual principle of mining versus sustainable development must be carefully observed, particularly as far as the radioactive elements are concerned.