



Groundwater pollution scenarios in the watershed of the Arroyo Santo Tomas (Cuba)

Hermes Farfan Gonzalez (1), Carlos Dias Guanche (1, 2), Mario Parise (3), Carlos Aldana Vilas (1), Manuel Valdez Suarez (1)

(1) Escuela Nacional de Espeleología "A. Núñez Jiménez", Sociedad Espeleológica de Cuba, Viñales, Pinar del Río, Cuba (farfanh@has.sld.cu) (2) Dpto. de Geología, Facultad de Geología y Mecánica, Univ. Pinar del Río, Cuba (3) National Research Council - IRPI, Bari, Italy (m.parise@ba.irpi.cnr.it)

Any socio-economical activity performed by man may affect in some way the quality of groundwater. This determines the possibility of several hazard scenarios, as regards groundwater pollution and the related risk to the human society, which are dependent upon both the anthropogenic activities and the presence and distribution of the elements at risk. In karst, the situation is even more difficult and severe, due to high susceptibility to pollution, and to the intrinsic characters of karst aquifers, including heterogeneity and anisotropy, different permeability types, and complexity of flow domains. At Cuba, over 65% of land is interested by karst processes, and approximately 80% of the water resources comes from karst areas. From these numbers, the crucial importance of studying cuban karst arises. As a matter of fact, almost the whole social and economical activity of the country occurs over karst. In this contribution, scenarios of groundwater pollution are described in the watershed of Arroyo Santo Tomas, one of the most important karst areas at Cuba. The watershed consists of five sub-catchments of the dendritic asymmetric type: Santo Tomas, Bolo, Penate, Tierra, and Los Cerritos. These five water courses join within the Sierra de Quemado ridge, giving origin to the Gran Caverna de Santo Tomas. This, with its over 46 km of underground passages distributed in 7 different levels, is among the most important cuban karst systems, and has been object of studies and researches since several decades. Most of the social and economical activities in the region are developed in the Santo Tomas

valley: as a consequence, in this area the main hazard scenarios have to be analyzed, as regards both surface water and groundwater. In order to evaluate these scenarios, all the anthropogenic activities which may potentially threaten the groundwater quality have been mapped and described. Most of them are concentrated in the lower portions of the watershed, at the margins of Sierra de Quemado.