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Hazard related to CO_2 and H_2S emissions in the Roman province

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The city of Rome lies between the two Quaternary volcanic complexes of Mts. Sabatini, to the North, and of Alban Hills to the South. Both these volcanic areas are characterized by zones with a huge endogenous degassing and several accidents have occurred to people and animals in the last 20 years. CO_2 is the main component (up to 98 vol.%) of the gas emissions followed by H_2S (1-2 vol.%), and N_2. The Caldara di Manziana depression hosts the main gas manifestation of Mts. Sabatini. Here a total (diffusive and viscous) CO_2 release of ca. 160 tons/day from 0.15 Km^2 has been measured by means of accumulation chamber (a.c.) surveys. The Colli Albani edifice extends to the south-eastern periphery of Rome. Its main gas emission zones are Cava dei Selci and Solforata di Pomezia. Cava dei Selci is an area located in the suburb of the homonymous village. CO_2 diffusive flux from the soil (measured by a.c. from 6000 m^2) ranged between 25 and 5 tons/day in the last 7 years. The continuous monitoring of CO_2 and H_2S in air (1m) in the confining village has shown the frequent overcome of the (TWA and STEL) threshold limits for both gases. At Solforata di Pomezia a 44 tons/day CO_2 diffusive flux has been estimated from 1.9 hectares, with 0.5 tons/day of H_2S. On 2007, two multi-technique surveys have been carried out to estimate the total gas output of these three degassing sites, by measuring CO_2 and H_2S fluxes from the soil (by a. c.) and the gas flux from bubbling pools. Moreover the CO_2 and H_2S

concentration in air were measured by several TDL profiles. Results confirm the high gas hazard of these areas. Particularly in late afternoon and night, when wind strongly lowers, lethal concentrations are frequently reached by H_2S, whereas CO_2 remains at high but tolerable values.