



Risk Analysis to Groundwater Pollution on Karstic Drinking Water Protection Zones

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In large part of the world karstic aquifers represent important drinking water resource. Capture zones for drinking water supply are usually positioned on karstic springs with relatively high outflow and large recharge areas. Consequently water protection zones are spread on large areas behind springs used for water supply. These large protection zones cause several conflicts between urban and rural development on one side and groundwater protection requirements on the other side. Several mechanisms were developed to cope with these problems. Risk analysis for groundwater pollution is one of them. It is procedure developed to estimate potential risk to groundwater that is captured for water supply. It consist of several steps; analysis of technical conditions under which groundwater is captured, analysis of hydrogeological conditions of the aquifer and the final most important estimation of potential pollutant transport through the aquifer and concentrations that can appear in the springs and wells that supply water to public drinking water supply. Estimation procedure is based on the parameter defined as relative sensitivity that represents the ratio between potential pollutant load and background values in the aquifer. If the data are available risk analysis in intergranular aquifers can be performed with relative easiness. The same is not true for karstic aquifers. They are very complicated and numerical modeling of real natural flow domain is usually not possible. Some different conceptual models and procedures based on water balance and mass balance should be developed. In the paper two case studies of risk analyses are presented. The first risk analysis is represented for the liquefied petroleum gas storage facilities reconstruction in the outer groundwater protection zone of Rizana river spring that represent the main water supply resource of the Slovene coastal region. The second risk analysis is represented for the small wastewater treatment plant construction in the outer groundwater protection zone of

the Vipava spring also supplied drinking water to several municipalities.