



Simulation of the transfer of organochlorine pollutants in an alluvial aquifer in an alpine valley: the case of tetrachloroethene

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During a series of environmental analysis carried out in soil and groundwater in the Alpine Valley (Rhône valley Western Switzerland), were identified high levels of chlorinated solvents, particularly the tetrachloroethene. The leakage of this pollutant originates from industry.

The geological substratum in this part of the valley is mainly composed of alluvial deposits and the deposit of a large rock avalanche. The sediments are composed of sandy silt, sandy clay, sand and gravel. The rock avalanche deposit which is the wall of the alluvial aquifer consists of fine materials, stones and large debris mainly of limestone.

The investigations developed in this area have shown the presence of a contaminant plume of 60 m long and 35 m wide approximately. Thus the technique of venting / sparging was proposed as remediation measure. Despite the effectiveness of this technique, it turns out that there are still some pockets of contamination of groundwater in the area.

In order to assess the potential pollution, a numerical modeling was developed by using the Visual Modflow software. The stages of this modeling are:

- Selecting the parameters of the models;
- Developing conceptual and numerical models;
- Calibration and validation of the model;
- Reproducing the observed concentrations;
- Sensitivity analysis;
- Making a parametric study to see at different stages the tetrachloroethene plume.

The first results of the simulation show a slow leakage of the pollutant forming a pocket in the water flow direction.