

A regional flux-based risk assessment approach of contaminated sites on surface water and groundwater bodies

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In the context of the Water Framework Directive, management plans have to be set up about water quality issues in surface and ground water bodies in the EU. One of the first steps in this procedure is to evaluate the risk of contamination of these water resources, particularly the risk posed by contaminated industrial sites located in the water catchment. From the perspective of water resource management, each of these sites (taken individually) does not constitute a major threat. However, in heavily industrialised and urbanised areas, the cumulative effect of multiple contaminant sources is likely to present a risk. In order to propose adequate measures, the calculated risk should be first based on a so-called megasite approach of the problem. At the same time, the risk assessment should also be based on criteria that are able to reflect the risk of water quality deterioration, in a cumulative way and at the scale of the whole surface water or groundwater body.

The objective is here to describe an integrated flux-based risk assessment approach for groundwater and surface water bodies including the associated ecosystems and its first application on the groundwater body 'Gravels and alluvial deposits of the Meuse river between Engis and Herstal' in the Walloon Region of Belgium, which has been classified at risk of not reaching a good quality status by 2015.

Inventory of proved or potential contaminant sources, point-type and resource-type receptors and numerical modelling of the groundwater body feed the different steps of the SPR regional risk assessment schema. Furthermore, an indicator of the qualitative status of the groundwater body, based on the TRIAD approach and on the SEQ-ESO indicator currently used within the Walloon Region is developed and serves as basis for a socio-economic approach that is intended to provide indications on costs and benefits generated by total or partial remediation of the contaminated water bodies according the different management scenarios.