

ENVIRONMENTAL IMPACTS ASSESSMENT OF REMEDIATION USING LCA METHOD

HODNOCENÍ ENVIRONMENTÁLNÍCH DOPADŮ SANACE POMOCÍ METODIKY POSUZOVÁNÍ ŽIVOTNÍHO CYKLU

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Abstract:

The remediation of contaminated sites is carried out in order to reduce risks to human health and ecosystems. Even if remediation provides a cleaner local environment, it may also have negative secondary environmental impacts on the local, regional and global scale, such as depletion of natural resources (consumption of energy, fuel and materials), air and water pollution, noise etc.

Life cycle assessment (LCA) is a useful tool for assessing the total environmental impact of a remediation project. LCA is a method considering the overall environmental impact over the whole life cycle of a product, process or activity. It is the so called „from cradle to grave“ concept. In a LCA study, all processes of a life cycle should be included from obtaining primary raw materials to removing or recycling of wastes.

Assessment of a remediation technology is usually based on an initial and final concentration of pollutants. The LCA approach enables to consider not only the environmental impacts of the contamination but also the impacts of the remediation process. If the sum of secondary impacts and impacts of residual contamination is lower than the impacts of the initial contamination, the chosen remediation technology is beneficial from the environmental point of view. In the decision-making, LCA can help to choose the best technology to reduce the environmental burden of the remediation service or to find the most burdening part of process in order to improve it.

In this study, we used data from a concrete remediation in the Czech Republic. Soil polluted with chlorinated ethylenes was treated using ex situ venting. Primary environmental impacts of initial contamination and secondary impacts of remediation process associated with ex situ soil venting were assessed and compared using GaBi software and database.

Keywords:

Site remediation, Life cycle assessment (LCA), Contaminated sites, Ex situ venting