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Circular material flow in construction – what to consider optimised mass management when waste is to become a resource

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Annually, millions of tons of granular material such as excavated soil, asphalt, crushed rock and concrete are generated in the building and construction sector in Sweden alone. These materials often exhibit elevated concentrations of several potentially hazardous substances compared to background values. These materials are often being regarded and treated as waste due to a lack of appropriate and optimised environmental risk assessment for reuse purposes. Subsequently, this classification prevents materials technically suitable for reuse forming circular material flows. Standardized and scientifically based criteria for reclassifying these materials as products rather than waste are lacking.

The goal of this project (co-financed by the Swedish Transport Authority and SBUF, the Swedish construction industry's organisation for research and development) is to enable circular flow of surplus construction materials such as excavated soil, asphalt, crushed rock and concrete with regard to environmental and health risks.

To achieve this the project focuses on improving the knowledge on the environmental properties of those surplus materials as well as by developing methods to assess governing environmental risks associated with circular use on a scientific basis. These will form the backbone of criteria for when masses can seize to be considered waste and be turned into a product instead: the End-of-Waste criteria. As these materials are often in contact with soil or can potentially leak hazardous substances to soil, a working hypothesis for the project is that the protection of ecological soil functions is governing for environmentally sound reuse, and as such for End-of-Waste criteria. Aspects that need to be considered for End-of-Waste criteria for these materials are many, broad and complex: Chemical and physical properties of the materials, concentrations and properties of potentially hazardous substances, transport and alteration of potentially hazardous substances as a function of their use and suitability in constructions, aging of the material, soil properties, other environmental and human health risks but also and legal and societal aspects.

We will gather information about use, classification and management of these materials and assess knowledge gaps regarding their environmental properties and as well as their potential environmental effects in light of current risk assessment, on ecotoxicological effects in soil particularly. Moreover, we will test and develop methods to more accurately reflect environmental risks that recycling of these material entails. Results will be used to outline relevant End-of-Waste

criteria with regard to environmental and health risks. These criteria will be tested and evaluated.