

LEACHING BEHAVIOUR OF ASHES IN A LANDFILL COVER CONSTRUCTION

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In 2000 Telge Återvinning – a waste management recycling company – started investigating ashes from the incineration of biofuel and industrial waste in collaboration with the Division of Waste Science and Technology at Luleå University of Technology. The company was given a permit from the Swedish Environmental Court to cover four hectares of their municipal waste landfill.

In 2006 the company received an unlimited permit to cover the remaining part of the landfill using secondary materials and following the tested design.

Residuals from household and industrial waste were tested. Initially, residuals from biofuel incineration were subject to testing. Later the material palette was extended to treated MSWI ashes, waste water sludge, contaminated soils, and compost. Several different sub-fractions of ashes were included in the investigation e.g. fly ash, aged bottom ash, and bottom ash products after up-grading including dewatering, separation and sifting.

Six test areas were built in order to give a good representation for cover construction in flat and steep areas with different compositions of liner materials.

The results show that in all areas the hydraulic conductivity construction yields less than 50 liters per square meters and years and can be less than 5 liters in a repository for hazardous waste if required. The leachate below the liner varies depending on the used materials in the different areas. In general, it contains high concentrations of chloride, TOC and nitrogen but low concentrations of heavy metals and other trace elements.

In accordance with literature data the field observations show the liner material constructed only by ash material under certain conditions can form a monolithic structure due to very slow processes thus indicating small pore volumes that unable water – air to interact with other media.