

ABSTRACT

Electrokinetic monitoring of synthetic geoclay liners in disposal site constructions

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Following various legal requirements, e.g. inside the European Community, disposal sites must be provided with seals that reduce leakage of substances of environmental concern to the surroundings to a low level. These seals are often based on synthetic geoclay liners containing bentonite as well as mixtures of bentonite and other materials. The proper functioning of these constructions over long periods of time is very important and the installations must be monitored regularly to make certain that they operate as intended.

However, no method is presently available for any detailed monitoring of the continued appropriate functioning of a liner system (except through observation of drainage). One possibility for such a monitoring system that we have tested, is the measurement of the frequency dependent impedance between electrodes placed on both sides of the liner.

In laboratory tests we have found that the impedance signal reflects the moisture and salt content of the bentonite and thus provides information on the status of the bentonite.

Studies have also been made of configuration and signal transfer issues at a disposal facility. The results indicate that considerable flexibility exists regarding the arrangement of the electrodes along and across a liner or tightening layer. A prerequisite for this is probably the utilization of modern means for signal transfer including optical fibers.