

## **CLAY LINERS FOR SOLID AND HAZARDOUS WASTE LANDFILLS: HOW EFFECTIVE THEY REALLY ARE?**

**E.A. VOUDRIAS**

*Department of Environmental Engineering, Democritus University of Thrace,  
GR 67100 Xanthi, Greece*

### **ABSTRACT**

In this work, we apply the concept of the *sorption chemical barrier*, as a means of improving landfill liner performance. The sorption barrier is formed by addition of the organoclay HDTMA-montmorillonite to a fine sand – bentonite liner. Using mathematical model simulations, we demonstrate that such a liner retards significantly the transport of leachate components, thus, increasing the useful life of the liner by more than one order of magnitude. This increase results in smaller liner thickness, required to provide equivalent protection with the liner containing no organoclay. Clay liner design based on hydraulic conductivity alone neglects the early breakthrough due to hydrodynamic dispersion and, therefore, is not a conservative one.