

LOCATION OF LEACHATE IN A CLOSED LANDFILL GEOELECTRICAL METHOD

Leachate is a hypersaline fluid, highly pollutant, that is formed by a bio-degradation process of the organic matter in landfills. The high salt concentration of the fluid determines - in the presence of an electric field generated between two dipoles current - a sort of "battery effect", which is a physical characteristic that can be easily identified with the geoelectrical method. The effect of induced polarization (IP) in the subsurface is determined by two main mechanisms: the electrode polarization and the membrane polarization. The former is mainly caused by the clay minerals present in rocks or sediments, the latter by presence of conductive minerals. IP measures are carried out in the time domain, the effect of induced polarization measurement is estimated following the decay of the voltage after the stop of the current sent in the ground. The unit of induced polarization, called also "apparent chargeability" is usually expressed in mV / V or ms. The apparent chargeability values are processed with a reverse numerical model to obtain a tomographic model.

Project:

Detection of leachate inside a closed municipal solid waste landfill (North Italy) – 2011. The solid waste lies directly on a clayey soil, without any lining

Scope of the survey :

Evaluate the presence and the characteristics of the leachate (degree of salinity, distribution of the leachate, etc.)

Survey method :

Multi electrode geoelectrical method, with acquisition of rho and IP parameters in 12 lines positioned on a regular grid

Obtained results:

The survey has pointed out the presence of «bubbles» of leachate positioned at the border of the middle road (rain water infiltration) and at the border of the nearby landfill cell with HDPE capping

