

LOCATION OF ILLEGAL WASTE DISPOSAL SITES FREQUENCY DOMAIN ELECTROMAGNETIC METHOD (FDEM)

The frequency domain electro-magnetic survey (FDEM), is a cost saving method to obtain, in a short time, maps of electrical conductivity and magnetic susceptibility of large areas under investigation. The FDEM data area acquired with a portable equipment that does not require contact with the ground (photo), in a regular grid of points (usually with spacing between lines equal to 2x2 m). The geophysical parameters (conductivity e susceptibility are obtained by correlation with the quadrature of the secondary EM field and the in-phase value between primary and secondary field, and represent the «average» value of the shallow part of the subsoil (namely 4-5 m).

Because the parameters conductivity and the magnetic susceptibility are strongly related to the physical characteristics of soil (type, content of water, content of clay, etc.) or with the occurrence of extraneous substances in the subsoil (underground utilities, waste, etc.), there are several application for the FDEM method.

The case 1 (mag. susceptibility map on an old slurry waste disposal of a mine) highlight the selective disposal of the ferrous sediments toward the center of the landfill (red color).

The second case (2) shows the conductivity map on a green field with an illegal buried waste disposal. The high value of conductivity (from green to red color) has defined quite clearly the contour of a illegal landfill and the alignment of a metallic gas pipe. The higher conductivity values in the southern part of the landfill (red color) are related to foundry waste (iron rich waste), according with the results of some borehole testing made on the stronger anomalies.

