Waste site characterization using integrated transient electromagnetic and vertical gradient magnetic methods near Longerich to the northwest of Cologne, Germany.

Initiative: Förderangebot für geflohene Wissenschaftler:innen aus Afghanistan

Bewilligung: 16.07.2018

Laufzeit: 2 Jahre

Waste sites that have been formed in an uncontrolled manner with little or no documentation constitute a serious risk for the environment and can also represent a main source for groundwater contamination. Lots of old waste sites were found in Germany at places where shallow boreholes have been used for observation, monitoring, and evaluation. The waste site to be studied in this project is located to the northwest of Cologne. It is formed as a result of a longterm warehousing of various kinds of industrial waste and household refuse in a gravel pit and is covered by several meters of soil layer.Determining the depth and geometry of the lower boundary of the waste body constitutes a challenging and difficult task. Moreover, the intrusive sampling of buried waste sites is expensive and time consuming. To address this problem, an intensive integrated transient electromagnetic (TEM) and gradient magnetic survey is planned to be employed in the proposed project to assess the waste site as those non-invasive techniques easily detect metallic and conductive objects buried at shallow depths. In addition, they can provide qualitative information about the contents of the waste site. Furthermore, they can focus the sampling effort and can thereby reduce the number of the required invasive samples, thus decreasing the time required to depict the landfill.The proposed project will focus on the combined interpretation of TEM and Magnetic data over a grid covering the waste deposit to detect its geometry through developing a realistic 3D waste site model.The results of the study will play a significant role in the assessment of environmental risks at the waste location.

Projektbeteiligte

Prof. Dr. Bülent Tezkan
Universität Köln
Geowissenschaften
Institut für Geophysik und Meteorologie
Köln

Dr. Ismael Ibraheem
Universität Köln
Institut für Geophysik und Meteorologie
Köln