

Characterization of an alluvial fan aquifer system in Bolivia by electrical resistivity tomography and induced polarization parameters

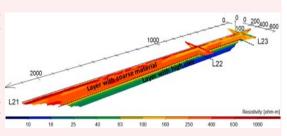


ANDRES GONZALES^{1, 2} AND TORLEIF DAHLIN¹

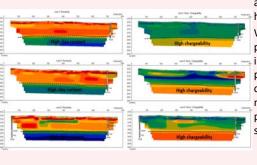


The rapid agricultural development in the alluvial fan of Punata (Bolivia) has caused an increase of demand for water, therefore the drilled wells has increased considerably in the last years. The monitoring of the groundwater level shows a decreasing trend of the water table. Probably the main reason for this decline is due to over-extraction. Additionally, there is a lack of knowledge regarding the geometry and properties of the local aquifer system.

Electrical Resistivity Tomography (ERT) surveys coupled with Induced Polarization (IP) measurements were conducted in the alluvial fan of Punata. The aim of these surveys is to obtain detailed information about the geometry of the local aquifer system. A total of 26 ERT surveys were performed covering an approximate length of 30.0 km. Besides ERT surveys, 20 lithology columns and 15 well-loggings were used to support the interpretation of the ERT profiles.

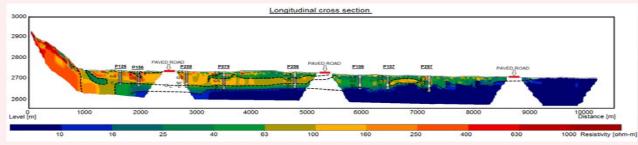


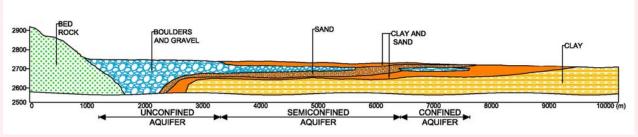
The results show a complex structure in the apex region of the fan dominated by fluvial and colluvium deposits, while in the distal area the stratification is smoother and is dominated by lacustrine deposits. The ERT surveys yield valuable information, revealing the existence of two main layers: one is composed mainly by coarse material (boulders, gravel



and sand), the other layer has a high clay content.

When ambiguities were presented during the ERT interpretation, IP parameters (i.e. chargeability and normalized chargeability) proved to be useful for solving these ambiguities,





Contact information (Andres Gonzales | 1 Engineering Geology - Lund University, Sweden; 2 Laboratorio de Hidráulica - Universidad Mayor de San Simón, Bolivia | andres.gonzales@tg.lth.se