

HYDROGEOLOGICAL MODELING IN AN ALLUVIAL FAN OF COCHABAMBA-BOLIVIA

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ABSTRACT

The growing aquifers exploitation in the Central Valley of Cochabamba demonstrate the necessity of a better understating by monitoring piezometric levels and setup a hydrogeological model to evaluate the aquifer's behavior. Around 65% of water consumption for the metropolitan area of Cochabamba comes from groundwater. The study area is located in El Paso at the northwest zone of Cochabamba Valley, considered one of the most important zones for groundwater exploitation. The study zone is located inside of an alluvial fan conformed by boulders, gravels and sand. The objective of this study is to update and expand the monitoring levels within well network in El Paso, as well as a better understanding of the groundwater flow behavior using a hydrogeological model. The model was setup with the package MODFLOW and measurements of levels were made for calibration and validation of parameters. The comparison of simulated heads against observed ones showed a root mean square (RMS) of 5.69 m and a correlation coefficient of 0.75. The hydraulic conductivity was identified as the most sensitive parameter. The model was run in steady state showing a positive difference in the mass balance indicating a greater input by 26 m³ to the system. The main flow direction is from north to south parallel to the surface slope where the direction may suddenly change in some points due to well operation. The results showed a balance in the system which is feasible to carry out studies in transient state to identify the changes in larger periods. No overexploitation was detected due to a balance of a steady state.

Keywords: Groundwater, El Paso, Cochabamba, Hydrogeological Model, Piezometric Levels, Steady State, Groundwater Flow.

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