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Numerical Simulation of Groundwater Flow in Ili River Basin, Xinjiang, China

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Abstract: Numerical-model constitutes the main method used to solve the groundwater quantity management problems and to evaluate the groundwater flow mixing between different aquifer levels. This numerical method has the ability to consider the complicated hydro geological characteristics that vary according to the temporal and spatial conditions. In this study, on the basis of analyzing the numerical simulation methods of groundwater systematically and combining water resources system of study area, using a three dimensional finite-difference model for simulate ground-water flow in the Ili River Basin to gain a better understanding of the ground-water flow system and to evaluate the hydraulic effects of artificial recharge of imported water. Taking systematic theory and sustainable development idea as direction, using modern water resources and hydro-geologic theory methodology as well as computer analogue technology, we carried out the research work about the groundwater forecasting in the study area. For groundwater analogue calculation of this time, we introduced more advanced Three-dimensional Visual Calculation Software (GMS), established math model of groundwater system in the study area, and to forecast groundwater motion law in the condition of existing situation. Results of the study will provide efficient analysis methods for estimate the sustainability of the groundwater resource and to delineate suitable plan for future groundwater management in the Ili River Basin and provide the significant reference for the evaluation of scientific management of local groundwater resources.

Keywords: Numerical Simulation; Groundwater; Finite Difference; Ili River Basin