



Suitability Evaluation on River Bank Filtration of the Second Songhua River, China

Lixue Wang, Xueyan Ye, and Xinqiang Du

College of Environment and Resources, Jilin University, China (duxq@jlu.edu.cn)

The Second Songhua River is the biggest river with the most economic value in Jilin Province, China. In recent years, with the rapid development of economy, water resources and water environment problem is getting prominent, including surface water pollution and over exploitation of groundwater resources, etc. By means of bank filtration, the Second Songhua River basin might realize the combined utilization of regional groundwater and surface water, and thus has important significance for the guarantee of water demand for industrial and agricultural production planning in the basin. The following steps were adopted to evaluate the suitability of bank filtration nearby the Second Songhua River : Firstly, in order to focus on the most possible area, the evaluation area was divided based on the aspects of natural geographical conditions and hydraulic connection extent between river water and groundwater. Second, the main suitability indexes including water quantity, water quality, interaction intensity between surface water and groundwater, and the exploitation condition of groundwater resource, and nine sub-indexes including hydraulic conductivity, aquifer thickness, river runoff, the status of groundwater quality, the status of surface water quality, groundwater hydraulic gradient, possible influence zone width of surface water under the condition of groundwater exploitation, permeability of riverbed layer and groundwater depth were proposed to establish an evaluation index system for the suitability of river bank filtration. Thirdly, Combined with the natural geography, geology and hydrogeology conditions of the Second Songhua River basin, the ArcGIS technology is used to complete the evaluation of the various indicators. According to the weighted sum of each index, the suitability of river bank filtration in the study area is divided into five grades. The evaluation index system and evaluation method established in this article are applicable to the Second Songhua River basin, which have clear pertinence and limitation. For future generalization of the evaluation index system, the specific evaluation index and its scoring criteria should be modified appropriately based on local conditions.