

Groundwater System in Seoul Area:
Line-Type disturbance on groundwater system
(서울시 지하수 시스템: 지하수위의 선형 변화 구조 분석)

김윤영*(Yoon-Young Kim)·이강근(Kang-Kun Lee),

서울대학교 자연과학대학 지구시스템과학과

서울특별시 관악구 신림동 산56-1

Tel: 02-873-3647, Fax: 02-874-7277

E-mail: yykim@aqua.snu.ac.kr, kklee@aqua.snu.ac.kr

This is a part of the study performed to understand the groundwater flow system in Seoul area and it is focused on the analysis of fluctuation pattern of groundwater level related to Han River and subway drainage system. The groundwater levels of the observation wells near Han River were affected by waterlevel fluctuation of the river caused by tidal effect. Groundwater tables fluctuate between highest and lowest together along with those of Han River level once a day. The groundwater system along Han River from Inchun to Chamsil Low Dam shows line type fluctuations of groundwater level parallel to the flow direction of the river.

For the simulation of the water intrusion to the integrated river-aquifer system, a tidal river model is investigated and analyzed considering the interaction between the river and the aquifer. The effect of daily fluctuation is obvious in Han River. Aquifer system around Han River is susceptible to groundwater pollution and the subsequent transport of contaminants into the water system of Han River. The groundwater discharge from the unconfined aquifers to tidal river can produce a very complex system characterized by a fluctuating water table due to tide.

During the excavation of tunnel and urban subway, it is necessary to pay attention to erosion or collapse caused by the change of groundwater state. An observation of groundwater behavior has been made around a tunnel during

its construction. This study involves a number of information such as the collection of stratigraphic data from borehole logging, outcrop faces, and the assessment of local groundwater flow conditions, to predict the groundwater inflows through the face of the subway tunnel. Seepage rates are variably distributed along the subway route. Groundwater drained into the subway tunnels is collected to pumping stations. Using hydrogeological data which are collected during the subway construction, groundwater flow model was applied to simulate the flow characteristics of groundwater system along the subway lines. The changes in groundwater table associated with the subway pumpage are calculated. The groundwater system along the subway shows line type drawdown pattern..

Key words: Urban Groundwater; Han River; Chamsil Low Dam