



## Variation characteristics of hydraulic gradient and major flow direction in the landfill soils

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Hydraulic gradient of the landfill soils is estimated by Devlin (2003) method, and variation characteristics of it from rainfall and permeability of the aquifer material are analyzed. Study site is 18 m × 12 m in the lawn in front of the Environment Research Center at the Pukyong National University, and core logging, slug/bail test and groundwater monitoring was performed. Slug/bail tests were performed in 9 wells (except BH9 well), and drawdown data with elapsed time for bail tests were analyzed by Bouwer-Rice and Hvorslev methods. Average hydraulic conductivity estimated in each of the test wells were ranged  $1.991 \times 10^{-7} \sim 4.714 \times 10^{-6}$  m/sec, and average hydraulic conductivity in the study site were estimated  $2.376 \times 10^{-6}$  m/sec for arithmetic average,  $1.655 \times 10^{-6}$  m/sec for geometric average and  $9.366 \times 10^{-7}$  m/sec for harmonic average. Permeability of landfill soils in this study site was higher east side than west side. Groundwater level in 10 wells was monitored to 44 times from 2 October to 7 November, 2007. Groundwater level of the study site was ranged 1.187~1.610 m, and average groundwater level in each of the wells was ranged 1.256~1.407 m. Groundwater level was higher east side than west side of the study site, and this distribution is identify to it of hydraulic conductivity. Hydraulic gradient and major flow direction for 10 wells site were estimated  $0.0072 \sim 0.0093$  and  $81.7618 \sim 88.0836^\circ$ . And, hydraulic gradient and major flow direction for 9 wells were estimated  $0.0102 \sim 0.0124$  and  $84.6822 \sim 89.1174^\circ$ . Hydraulic gradient of the study site was increased from rainfall (83.5 mm) on October 7, this was caused by that groundwater level of the site with

high permeability was higher. Hydraulic gradient estimated on and after October 16 was stable, this is caused by few rainfall. Thus, variation of the hydraulic gradient in the landfill soils was confirmed that it was controlled by rainfall.