

Case investigation of the efficiency degradation of open loop geothermal cooling and heating system(OLGCHS) in Korea

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This study was conducted to improve energy efficiency of open loop geothermal cooling and heating system (OLGCHS) showing low energy efficiency. When OLGCHS were installed, hydrogeological properties and groundwater yield were not considered. Therefore, various problems such as groundwater depletion, circulatory disturbance of groundwater, groundwater overflow, clogging by materials, and decrease of energy efficiency occur in many facilities which OLGCHS was installed and maintenance is very difficult. These circumstances have a negative influence on the spread of the OLGCHS in Korea. However, there is no proper investigation and cause analysis to solve the above problems. In this study, an advanced standing column well(SCW) was developed. In advanced SCW, wells used in OLGCHS are arranged in a row and these wells are connected using pipeline. Therefore, well depth was reduced and groundwater circulation was improved in the advanced SCW compared to a common SCW. In addition, installation cost can decrease and energy efficiency can increase. This research was supported by a grant(16CTAP-C116546-01) from Technology Advancement Research Program funded by Ministry of Land, Infrastructure and Transport of Korean government.

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