

Impact of ground source heat pumps operation on groundwater condition

KIM, Namju^{1*} ; PARK, Youngyun¹ ; JEON, Woo-hyun¹ ; YUN, Sang woong¹ ; LEE, Jin-yong¹

¹1Department of Geology, Kangwon National University, Republic of Korea, ²Geo Engineering Co. Ltd

This study was conducted to summarize status of installation of open loop geothermal cooling and heating system (OLGCHS) and to evaluate impact caused by its operation on groundwater condition. In this study, six facilities where OLGCHS is installed were considered. Groundwater is directly used in OLGCHS. The facilities considered in this study have been operated over two years. Groundwater temperature ranged from 6.0 to 24.2oC. Water temperature of natural groundwater and groundwater used to operating of OLGCHS showed difference of 5 to 9oC. pH and EC ranged from 7.5 to 9.1 and from 138 to 465 uS/cm, respectively. pH and EC of natural groundwater and groundwater used to operating of OLGCHS did not show significant difference. All groundwater meet Korean standard of water quality for domestic purpose In addition, saturation indexes of most major dissolved components except H₄SiO₄ showed lower than 1. These results represent undersaturated condition and that there are no minerals which can be precipitated from groundwater used in OLGCHS. Consequently, impact of ground source heat pumps operation on groundwater condition do not observed. However, these monitoring have been conducted continuously because contamination by ground source heat pumps operation can occur in any time. This work is supported by the Energy Efficiency and Resources of the Korea Institute of Energy Technology Evaluation and Planning (KETEP) grant funded by the Korea government Ministry of Knowledge Economy (No.20123040110010).

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