DETECTION OF SEA WATER IBTRUSION CAUSED BY TIDAL ACTION USING GEOPHYSICAL METHODS

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The 1 km^2 studied area is located in Sukchun-ri, Hwasung-koon, the southern part of kyeonggi province of Korea. In order to determine the extent of seawater contamination and a preferred channel of the seawater intrusion, DC resistivity and TEM surveys were performed. According to the resistivity map obtained from geophysical surveys, the study area is divided into two districts as relatively low (less than 30 ohm-m) and high (more than 30 ohm) areas. The distribution of the low resistive area is consistent with the distribution of the layer of composed pf clay minerals, and the resistivity of the clay miner layer decreases slowly as approaching to the old seashore. Hydrogeological analysis shows that the clay layer within a distance of about 200 m from the seashore has been already contaminated by sea water, and its electric conductivity is 8 times higher than that of the sand layer covered by the clay layer. According to the results of the 2-dimentional DC resistivity surveys with a dipole-dipole array, there are two preferred channels of seawater intrusions in the site, and both channels are in NW-SE direction from the old seashore. The DC resistivity and TEM monitorings were carried out along the preferred channel which has low resistivity zone extended to a depth of 80 m. The time series measured by those two methods fluctuates with a period of 12 hours. These observations show that the sea water intrusion caused by tidal action is still in progress along the preferred channel interpreted by the geophysical surveys.

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