

## Simple estimation method of shallow groundwater level with groundwater aeration sound

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This study provides a new method of groundwater exploration using groundwater aeration sound and reports the results of observations in Tottori sand dune, Japan. The groundwater aeration sound (GAS) is that the aeration sound generated in the vicinity of the saturated / unsaturated boundary. We have developed a device that can collect this small sound from the ground surface. The device consists of an acceleration pickup, needle, amplifying system, and level meter with a filtering function. The total weight of the device is 0.9kg; it is highly portability and workability.

On the assumption that there is a relevance to GAS level and groundwater level, we conducted a survey using the existing wells in experimental natural dune. As the results, there is the logarithmic relationship between the GAS level and groundwater level. With this relational equation, we investigated the GAS survey to estimate continuous groundwater level in Tottori sand dune. As a result, we got a valid result on hydrogeology. From these results, the estimation accuracy of groundwater level by GAS was demonstrated.

Keywords: Groundwater aeration sound, Groundwater exploration, Shallow groundwater, Tottori sand dune