

## Changes in permeability in the Hirabayashi well estimated by long-term groundwater-level observation

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The Hirabayashi well encountered the Nojima fault at the depth of 623.1 - 625.3 m, and we have been observing groundwater level until now. The groundwater-level observation shows that estimated permeability was constant between 1996 and 2006, then slightly decreased, and suddenly increased after the 2011 Tohoku-oki and the 2013 Awaji-island earthquakes. Pumping tests are carried out on 1996, 2000 and 2016. Permeability estimated by the three pumping tests is consistent with that estimated by groundwater-level observation. The temperature logging just after the 2016 pumping test indicates that main aquifer is not at the depth of 630 - 650m where the casing of the well was perforated, but is shallower than at the depth of 200 m.

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