

Long-term Groundwater Pressure Monitoring around the Horonobe URL: Decrease of groundwater pressure due to the shaft excavation

Hideharu Yokota[1]; Satoshi Yabuuchi[1]; Goji Tomura[1]; Keisuke Maekawa[1]

[1] JAEA

<http://www.jaea.go.jp/>

JAEA (Japan Atomic Energy Agency) has carried out measurement of the groundwater pressure by using deep boreholes in order to monitor any influences due to the construction of the underground facilities, to develop techniques for long-term monitoring of geological environment in the Horonobe URL (Underground Research Laboratory) Project, as a part of the research and development program on geological disposal of high-level radioactive waste. The construction of two shafts, the Ventilation Shaft and the East Shaft, began in 2006. Decrease of groundwater pressure could be observed in some measurement sections in the monitoring boreholes entitled HDB-3 and HDB-6 due to the shaft excavation. The results from observations also provide information about the extent of high permeable zone in the uppermost Wakkanai Formation around the shafts.

We estimate that decrease of groundwater pressure in HDB-3 and HDB-6 is induced by increase of groundwater inflow due to the progress of the shaft excavation, and that existence of the high permeable zone inferred by investigations including the borehole in the vicinity of the Ventilation Shaft causes the decrease of groundwater pressure in measurement sections of the deeper zone in HDB-3 and HDB-6.

From these results, it is estimated that high permeable zones distributed in layers at the neighborhood of boundary between Koetoi Formation and Wakkanai Formation around the shafts.

By the monitoring of groundwater pressure continued in future, we will grasp the sphere of influence due to the construction of the underground facilities, and relations between the decreasing of groundwater pressure and the hydrogeological structures.