

## Level monitoring of groundwater

Much of our drinking water is extracted from subterranean resources. Water that falls to the surface of the Earth drains not only into rivers and lakes, much of it will permeate into subterranean reservoirs. These so called aquifers are natural underground reservoirs that store groundwater.



Level monitoring of groundwater is critical to understand what is happening to the subterranean water resource and to allow any exploitation of this resource. Therefore, narrow boreholes are sunk into the soil called monitoring wells, that allow to monitor the groundwater level, the water quality and to map the area of water.

These wells will usually include a level monitoring system for groundwater to monitor and control how deep bore wells and water extraction is affecting the overall groundwater level.

If the soil is composed of permeable sand and rock, then as the water is extracted from deep bore wells, the overall water level of the area will be drawn down, as the resource water can easily flow from all separated reservoirs into the deep bore well. Also, if water permeates the soil e.g. due to rain, the underground reservoir is quickly restored and the water level increases rapidly, as the water can pass quickly through the permeable soil.

However, if the water is held in a barely permeable e.g. clay-like soil, then the water resource is stored in many small pockets. When water is then extracted from deep bore wells, the level monitoring of groundwater at the well will show a drop in water level quickly and it will take a considerably longer time to replenish from the surrounding area. Also the surrounding monitoring well levels will not change as rapidly as the water resource takes more time to pass through to the deep well.

Monitoring wells are also used for water quality monitoring, to ensure that pollution is not getting into the subterranean water supply. For example this may be critical around landfill sites where changes in the water level, e.g. due to an overflow, could allow contaminated water to escape and to contaminate pure groundwater reservoirs. Both, the level monitoring of groundwater and the monitoring of the stored contaminated water form a critical balance. Monitoring systems therefore usually combine level and water quality sensors to detect any contamination.



It is estimated that only 3 % of the total water resources on Earth are consumable fresh water, of which less than one-third are easily accessible, for the most part stored as groundwater. Therefore, it is essential to use reliable solutions for level monitoring of groundwater, to preserve these reservoirs and to exploit these resources sustainably.

Please find further information on this topic on our information platform [www.wika.com/hydrostatic-level](http://www.wika.com/hydrostatic-level)



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