

Monitoring well

Groundwater is the general term used to describe the water that has permeated into the surface of the earth and formed underground water lakes that are known as aquifers. The level of groundwater is monitored by special measuring instruments within so called monitoring wells. Monitoring wells are wells with a small diameter drilled into the ground, which are used for level monitoring of groundwater and water quality analysis .



Aquifers form an underground water reservoir where water reaches impermeable material such as a solid rock layer. Yet, it does not have a flat level top as we would expect with surface water, due to the difference in permeability of the surrounding soil, which complicates the measurement of level within the underground reservoir. They may also form at different depths and it is therefore not unusual to find several different aquifers at different depths in the same area. To learn more about this resource of water and to monitor the level of these reservoirs, monitoring wells are bored and used for level monitoring.

A monitoring well consists of a small diameter borehole tube that is sealed in the earth with a permeable screen section at the bottom, in an underground reservoir where water is expected to collect. The water will rise and fall in the tube following the ground water level and allowing level monitoring of groundwater. The groundwater level at that monitoring point will change due to seasonal variations, the effect of precipitation and the result of local water extraction. A level probe, usually, a submersible pressure transmitter will be used for level monitoring and the measured level may be logged over long periods of time to learn how the ground water level responds to precipitation and extraction of water.



By drilling a number of monitoring wells around a specific area, the groundwater level also called water table can be charted. Additional to the charting of underground groundwater resources, the monitoring well also plays an important part in monitoring the effects of pollution of the groundwater. Groundwater may be polluted by a surface spill of chemicals, by an overfilled or leaking underground storage tank or by the overuse of fertiliser on farmed land. All these potential contaminants permeate from the surface of the soil to the aquifer and will cause a sudden increase in level, which cannot be explained by natural precipitation of water.

Just as the water permeates the surface it may continue to move underground to deeper or farther reservoirs, for example, water permeates the soil on a hill it can build up in the soil beneath the hill and then emerge in the valley as a lake. Due to the movement of the water underground, monitoring wells even if located in the same area, may indicate different water levels higher in one monitoring well than in another. Therefore monitoring wells are often used to calculate the flow of subterranean water and to calculate how much water can be extracted from a reservoir without over-exploiting the resource..

Monitoring wells are therefore a key tool to monitor and visualise how ground water is stored and moves underground, a tool to secure that contaminated water is not used for consumption or irrigation and to keep track and control if water resources are exploited sustainably. Experience has shown that submersible pressure transmitters due to their ease of use and installation are a core component in many monitoring wells.

Please find further information on this topic on our information platform www.wika.com/hydrostatic-level



WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. +49 9372 132-0
Fax +49 9372 132-406
info@wika.de
www.wika.de