

THAILAND GROUNDWATER MONITORING SYSTEM

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The excessive groundwater extraction can deteriorate groundwater quantity and quality. The groundwater deteriorations occurred in Thailand include as continuous groundwater level decrease in central part, and saline water intrusion in northeastern and southern part. In addition, human activities such as improper waste management, industrial activities, and chemical uses in agriculture cause the contamination in groundwater which can impact human health, environment, and socioeconomic development. Therefore, regular and systematic monitoring of groundwater resources is necessary for managing groundwater effectively.

Currently, there are 1,943 groundwater monitoring wells which monitor groundwater level and groundwater quality in large scale covering 27 groundwater basins and 460 groundwater monitoring wells for the risk areas of contamination. Groundwater level measurement can be categorized into 3 methods. The first measurement method is using electric tape and data is collected twice a year. The second method is automatically measured and manually download via laptop. The third method is real-time measurement with installed network. The data are stored in database system of Thailand Groundwater Monitoring System (TGMS). In addition, an analysis of groundwater quality for physical and chemical parameter are conducted once a year. The analysis of heavy metals and Volatile Organic Compounds (VOCs) are performed where there is a risk of groundwater contamination. The data of groundwater levels and groundwater quality are stored in TGMS. It is a centralized information system of groundwater resource management for groundwater conservation and restoration. This will act as groundwater information service center to the public and governmental agencies through the website <http://tgms.dgr.go.th>.

In 2021, groundwater level was slightly changed. However, the aquifer (less than 100 meters) in Suphan Buri Province and Sukhothai Province was dramatically changed groundwater level decreases continuously from 15-20 meters below the ground surface in 2009 to 30-40 meters below the ground surface in 2021 due to excessive groundwater pumping for agriculture (rice). In the Critical Zones (Bangkok and its vicinity), It was found that groundwater level recovered and relatively stable at 15-25 meters below the ground surface in all the three aquifers of the Lower Chao Phraya River Basin (less than 150 meters). Meanwhile, in Phra Nakhon Si Ayutthaya Province and Nakhon Pathom Province, groundwater level in the deeper aquifer (more than 150 meters) continued to decline, and it was 35-50 meters below the ground surface.

In general, groundwater quality in Thailand is in the standard, except the quality of ground water in some parts of the country such as In Northeastern Thailand (Si Sa Ket Province). Freshwater in aquifer turns into brackish and saline water more than past because upconing of saltwater into freshwater in upper aquifer. In coastal areas, saltwater intrusion moves onto the land increase for shallow aquifer (less than 50 meters). Besides, contamination in groundwater can be problematic as a result of human activities. Groundwater is polluted by the heavy metals and VOCs. The concentration is higher than groundwater standard for consumption by Ministry of Natural Resources and Environment in landfills and industrial waste disposal areas (Chachoengsao Province, Phetchabun Province, Phetchaburi Province).

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