Groundwater Monitoring and Management

1、Introduction

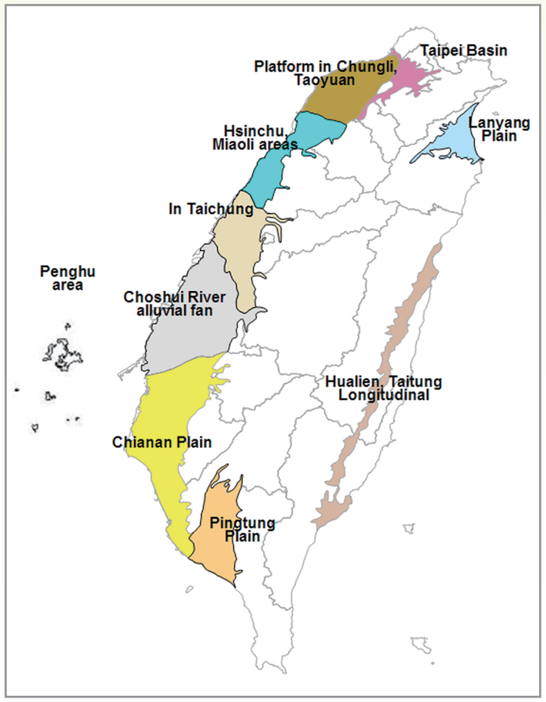
In Taiwan, global warming and climate changes extend the dry period and cause surface water resource shortage. As result, the groundwater resource is becoming increasingly important.

In order to monitor the groundwater quality of the first aquifer and to protect water resources from pollution, the Taiwan Environmental Protection Administration (EPA) and the Environmental Protection Bureaus (EPBs) of local governments have installed two kinds of monitoring wells, the Regional Groundwater Monitoring Wells (RGMWs) and the Site-Specific Monitoring Wells (SSMWs).

RGMWs are installed for monitoring long-term groundwater quality variation in Taiwan. The "Planning Project of Taiwan Regional Groundwater Quality Monitoring Networks" had completed in 1995 and totally 431 RGMWs were installed before the end of 2002.

EPA and EPBs have installed SSMWs at high potential contaminated areas including illegal dumping sites, industrial estates, gas stations, and large storage tanks to monitor the regional groundwater quality near the specific pollution sources. At present, EPBs of local governments maintain and manage 1,080 SSMWs in Taiwan.

In the past decade, EPA continuously monitored the groundwater quality and maintained monitoring wells. Through comprehensive and systematic evaluation process, the management mechanism was also developed. In addition, EPA integrates the groundwater quality data and builts the groundwater monitoring information exchange and supplies platform as an early-warning system to protect the treasure water resource and public health.



▲ Taiwan groundwater region map

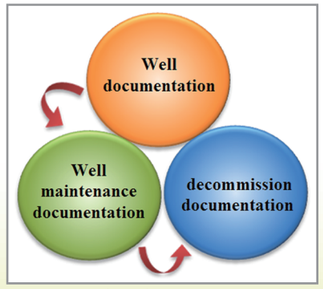
2、Objectives

- Assessing monitoring data and understanding the groundwater variation trends.
- Regular maintenance for maintaining wells status. and management of monitoring wells..
- By integrating the monitoring information, trace the groundwater quality background in Taiwan and the polluted potential.

3、Results

1. Completing monitoring wells management system

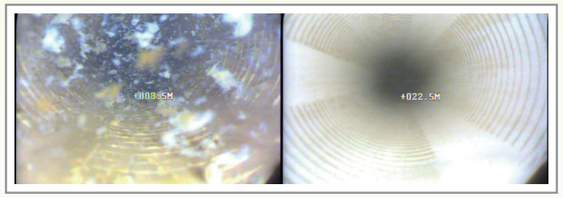
Since 2006, EPA has continuously maintained monitoring wells and sampled groundwater in Taiwan. By assessing the historical water quality data, the management projects were modified every year. Besides, EPA announced "Monitoring Wells Coding System" and "The Guideline of Site-Specific Monitoring Well: Installing, Maintaining and Decommission." According to the unified management process and the document system, monitoring wells in Taiwan can be managed efficiently. This management system also helps EPA to closure old or inappropriate wells which could be a contaminated source.



▲ complete document management system of monitoring wells

2. Sound Regional Groundwater Monitoring Network

The EPA has performed maintenance and abnormal objects removal to monitoring wells continuously to maintain well performance. Since 2004, the EPA has totally evaluated 365 wells and redeveloped 218 wells.



▲ Well Redevelopment

▲ Abnormal objects removal

3. Contaminated potential investigation

Through groundwater quality data analysis and periodical sampling of installed monitoring wells, EPA investigated groundwater quality of high polluted potential areas such as landfills, wastewater treatment plans, farms, industrial districts, science parks, and export processing zones since 2007.There are 2 polluted landfills and 19 contaminated industrial districts processing remediation and emergence acts in Taiwan.

4. Uniting the different administrating resources to develop the pollution preventing system

EPA has integrated different administer monitoring wells data which becomes part of decision making database and shared resources to get maximum benefits.

5. Education promotion

EPA continuously shares the experience of wells management knowledge and maintenance technologies to the public. In order to increase the consciousness of environmental protection and to enhance the understanding of groundwater to the public, EPA and EPBs work on public education promotion by setting billboards or bulletins which explain the meaning of the groundwater monitoring wells in primary schools.

▲ Education promation

4、Prospect

- Continuous maintenance and managements of the groundwater monitoring wells can maintain wells performance and gradually complete the groundwater quality database in Taiwan. Understanding the variation of groundwater quality can prevent soil and groundwater from pollution. Eventually, the water resource in Taiwan can be protected and prevent pollution.
- In the future, EPA will work on the "National Groundwater Monitoring and Contamination Preventing Networks" which monitor the groundwater quality variation and prevent the diffusion of contamination in Taiwan.

Soil and Groundwater Pollution Remediation Fund Management Board
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