

## SDG 6.5.4 Sustainable water extraction on campus

Where water is extracted (for example from aquifers, lakes or rivers) utilise sustainable water extraction technologies on associated university grounds on and off campus.

### Description

YunTech purchases 100% of its water from Taiwan Water Corporation, without utilizing any surface or groundwater extraction.

Extreme climate conditions increase the likelihood and severity of water shortages. The groundwater monitoring network carries the mission of combating drought. To enhance the overall effectiveness of the groundwater monitoring network and to provide substantial assistance and services related to groundwater hydrological observation operations, and to help promote groundwater conservation efforts, YunTech has collaborated with the Water Resources Agency of the Ministry of Economic Affairs to organize the "2022 Groundwater Monitoring Network Operation and Groundwater Conservation Plan". This ensures the continuous improvement and maximization of the functions of the groundwater monitoring network, the enhancement of the value-added application of groundwater observation data, and the ability to grasp the situation of groundwater resources and propose responsive measures, achieving the goal of sustainable use of groundwater resources, and preparing for water scarcity issues in advance.

### Evidence/outcome

#### • Project Implementation Content

#### 1. Technical Improvement of Groundwater Monitoring Network Operation Management

- (1) Supplementary investigation of basic information for observation wells across Taiwan, system updates, and improvements to real-time operations.
- (2) Compilation of the annual report on the operation of the groundwater monitoring network.

#### 2. Statistics and Analysis of Groundwater Hydrological Observation Data

- (1) Review of groundwater observation data and recording of anomalies (comparison and investigation).
- (2) Analysis of groundwater hydrological conditions and assistance with the compilation of hydrological monthly newsletters.
- (3) Rolling review of operational guidelines for groundwater monitoring stations.
- (4) Assistance in estimating the groundwater abstraction and recharge volumes for the Green National Income Accounts for the year 110 (Taiwan calendar year, corresponding to 2021 in the Gregorian calendar).

### **3. Planning and Effectiveness Evaluation of Groundwater Recharge Facilities**

- (1) Continued expansion of the planning for simple groundwater recharge facilities in the Zhuoshui River channel.
- (2) Estimation of the effectiveness of the simple recharge facilities in the Zhuoshui River channel.
- (3) Inventory of central government-controlled rivers and suitable locations for promoting recharge.

### **4. Investigation and Planning of Existing Drought-Resistant Water Extraction and Recharge Sites**

The feasibility analysis results of the existing drought-resistant water extraction and surrounding recharge sites (land, water source, and hydrogeological conditions) show that the evaluation scores for the surface infiltration recharge facility schemes for Xiaoli Creek and Han Creek are 76 and 90, respectively, both of which are suitable potential sites for surface recharge facilities.

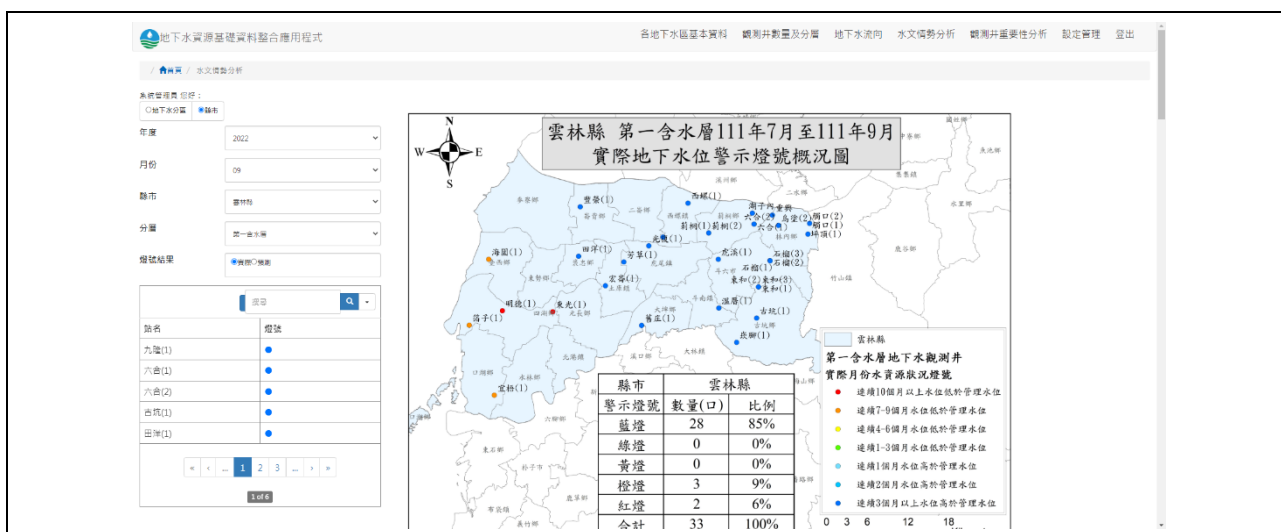
### **5. Discussion on the Contingency Measures for Drought-Resistant Wells**

Preliminary plans have been drafted for the contingency operation procedures for drought-resistant wells and groundwater emergency response procedures for construction site wells, to serve as a reference for subsequent groundwater drought response operations. At the same time, regarding the reasonable abstraction and management mechanisms for drought-resistant wells, a preliminary framework for groundwater level management and drought-resistant well abstraction has been established, with the principle of avoiding problems such as excessive abstraction leading to land subsidence or water quality pollution.

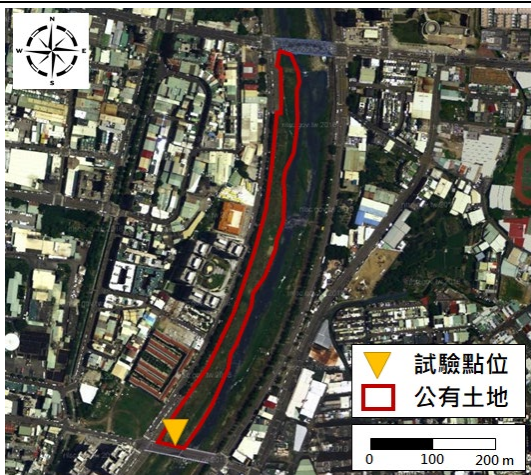
- **Outcomes**

1. An assessment and recommendation for the disposal of 3-3 level wells under the jurisdiction of the River Bureau has been carried out.
2. Based on the actual maintenance and management operations of observation wells in 2021 and 2022, the rolling revision of the annual quantitative goals is carried out. In conjunction with the condition and importance grading results of the observation wells and the location of water control districts, a priority list for the replacement of old observation wells is proposed and recommended.
3. It is estimated that from January to the end of November this year, the Zhuoshui River channel recharge area has provided a total of approximately 23.37 million tons of groundwater infiltration recharge. The use of hydrogen and oxygen isotope analysis of groundwater recharge sources shows that the recharge facilities have all played a role in recharging groundwater.
4. Additionally, the establishment of a recharge area in Pomegranate Class Creek has been completed. The results of electrical resistance detection also indicate a significant effect of groundwater recharge, with the water source near the river having superior recharge qualities and the potential to flow towards the left bank.

- An investigation and comparison of drought-resistant well water supply data and corresponding historical groundwater data from observation wells for the cities and counties that constructed drought-resistant wells in 2021 have been completed. Among them, it is shown that during the drought of 2021, the extraction of water from drought-resistant wells in Taoyuan, Miaoli, Changhua, Kaohsiung, and Pingtung did not bring irreversible impacts on the nearby regional groundwater environment.
- Preliminary contingency operation procedures for drought-resistant wells have been drafted, as well as a management mechanism framework for groundwater levels and drought-resistant well extraction, to be able to respond to the potential impacts of future extreme climate events and to prepare for the next drought.



### Groundwater Monitoring Network Operation and Groundwater Conservation Information System



Test Point Aerial View



Current Status of the Test Points



Installation of Double-Ring Infiltrimeters



Installation of Mariotte Bottles