



Analysis on Water Source Demonstration of Yushan Water Supply Project

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Abstract: Drinking water project is a key project in the process of urban and rural construction in my country, and it has a vital impact on people's daily life. Especially with the acceleration of urbanization in my country, domestic water has become a key factor affecting people's daily biochemistry. This paper determines the best water source scheme of the water supply project through the analysis of the water source of the Yushan water supply project.

Keywords: Drinking water project, water source argument, water quality analysis.

1. Introduction

With the continuous enhancement of national economic strength, rural social and economic development has also embarked on a fast lane. In the process of building a new socialist countryside, the safety of drinking water has become an important factor restricting local economic development [1-2]. It is very necessary to build safe drinking water projects and improve the quality of life of the masses [3], to liberate local labor resources and promote local economic development. In recent years, although the rural economy has developed, the problem of food and clothing has been basically solved, the living conditions, electricity, transportation and other conditions have been greatly improved, and the living standard has generally improved. However, the construction of drinking water facilities in the project villages has basically stayed at a low level, and people have been drinking groundwater that does not meet the sanitary conditions for a long time [4], which has caused adverse effects on the health of the people [5]. If this situation continues, it will affect a generation of people. Even the

health of generations. Drinking water safety significantly lags behind other infrastructure construction. The Party Central Committee and local governments at all levels attach great importance to rural drinking water issues, and new rural construction and a well-off society have put forward higher requirements for rural water supply. Solving the problem of water supply is an important manifestation of paying attention to people's livelihood and putting people first [6]. In a word, the construction of Yushan water supply project has important practical significance for promoting the political, economic and social development of the village.

2. Overview of the project area

Yushan Town is located at the foot of Gongwangling of Qinling Mountains, 15km southeast of Lantian County, Xi'an City, 34°12'N~109°30'E, bordering Bayuan Town in the east, Puhua Town in the west, and Jiu Jianfang Town in the south. It is adjacent to Hou Town in the north, with a total administrative area of 63.2km², 15 administrative villages, 100 villager groups and 28,636 people under its jurisdiction.

3. Project construction tasks and scale

3.1 Design Scope, Water Supply Object and Design Level Year

This water supply emergency supporting project is located in Huangshangtou Natural Village, Group 4, Yanhe Village, Yukou, with 19,767 people providing emergency drinking water. The design base year is 2013.

3.2 Project Scale

The task of this project is to solve the emergency drinking water problem for 21,238 people in ten villages in Yushan Town. The water supply scale is 1160m³/d.

4. Principles and requirements for water source selection

4.1 Principles of Selection

- (1) The water source is abundant and reliable.
- (2) The water quality of the water source shall conform to the national drinking water source water quality standards.
- (3) When the existing water source project is used as the project water source, if the original design task of the project is changed, the written consent of the original project competent department shall be obtained and attached to the preliminary design report.
- (4) The selection of water sources should consider factors such as safety, economy and convenience for water source protection.
- (5) When there are multiple water sources to choose from, the water quantity, water quality, investment, operation cost, construction and management conditions, etc.

shall be comprehensively compared technically and economically and then the best one shall be determined.

4.2 Requirements for Selection

- (1) When both groundwater and surface water can meet the requirements, surface water should be used first.
- (2) When using surface water sources, priority should be given to water supply from reservoirs with certain adjustment capacity.
- (3) There are no available reservoirs around the water supply area, and the groundwater cannot be used. If there is surface runoff with better water quality, a water diversion project can be constructed at an appropriate location for water supply.
- (4) When the existing centralized water supply projects in towns and villages have abundant water sources, reliable facilities and feasible technologies, the emergency water supply for drought relief in surrounding villages and towns should use the extended water supply of the existing engineering pipe network.

4.3 Groundwater and Spring Water Sources

(1) General situation of hydrogeology

When groundwater in this area is used as a water source, there is no unified mining plan, so the hydrogeological conditions are ominous, and only the existing wells are used for analysis and discussion.

a. The current situation of groundwater in the water supply area

There are a large number of people living along both sides of the river in Yushan Town, Lantian County. Since ancient times, they have used self-provided wells to live. With the rapid development of the economy, the continuous expansion of urbanization, the continuous increase of domestic water and the sharp decline of the groundwater level, the guarantee rate is low. In the dry season, it is very difficult for people and animals to drink water, and the contradiction is increasing, which greatly restricts the economic development of the region. The extracted groundwater has high salinity and high content of calcium and magnesium ions, and the voices of the masses for good water quantity and quality are rising.

b. The current situation of exploitation and utilization

At present, the depth of groundwater exploited by the masses' self-provided wells is 2-10m, and the village-level water supply well is about 50m. The main aquifer is the sand and pebble layer along the river. The groundwater type is submersible. 20t, the recoverable amount is decreasing, and the total recoverable amount of the water supply project is about 300m³/d.

(2) Evaluation of groundwater resources

This area is a poor water area for groundwater exploitation. As a water source, groundwater cannot meet the production and domestic water requirements of Yushan

Town, nor can it meet the needs of building a modern leisure, patronage and tourism town in Yushan Town. Therefore, the planning of groundwater sources is not considered.

According to the survey, the dew point of the spring water and the amount of ground water are too small, and it is impossible to drink it in a large area, and there is no long series of observation data. According to the actual measurement, the total utilization of spring water is about 100m³.

4.4 Surface Water Sources

Through the investigation of surface water sources in the surrounding areas of Yushan Town, Lantian County, there are Daogouyu River, Liuyu River and Qingyu River. There are no reservoirs built on these three rivers. Daogouyu River is the main channel of Bahe River. People live densely, it is difficult to protect the water source, and the sediment content in the river is large; Chuyukou is relatively close to Yushan Town, the river above Yukou is clear, the people live less, the water source is abundant, and the forest coverage is good, which can achieve more than 95% guarantee rate of drinking water supply for the whole town. The pressure is guaranteed, so the Qingyu River is selected as the water source for this design, which is an ideal water source scheme for drinking water.

4.5 Analysis of Water Source Water Quality

The water was taken at the mouth of the ditch of Qingyukou and sampled and analyzed. The analysis showed that the surface water of Qingyu River is clear and belongs to the standard weak alkaline water quality. Its physicochemical and harmful substances content meet the drinking water requirements. Except that the number of clusters exceeds the national drinking water standard, the rest of the indicators meet the requirements. After purification and disinfection, they can be used as domestic and production water. Therefore, in the water purification process, the corresponding technical measures should be sampled for water treatment. The surface water of Qingyu River can reach the first and second grade standards, and meet the water quality requirements for industrial and domestic water.

5. Conclusion

The water supply scale of the emergency water supply supporting project for drought relief in Yushan Town, Lantian County is 1160m³/d, and the daily water inflow of the Qingyu River in the project area (95%) and the Qingyu River in the project area (95%) is 2534m³, more than The maximum water consumption is 1160m³/d, indicating that the water supply capacity of the selected water source can meet the water demand of the Yushan Town drought relief emergency water supply supporting project. Except for *Escherichia coli*, the water source meets the drinking water index, indicating that

the selected water source can meet the water demand of Yushan Town's drought-relief emergency water supply project in terms of water quality and water quantity.

At present, the depth of groundwater exploited by the masses is 2-10m, the village-level water supply well is about 50m, the main aquifer in the shallow hole is the sand and pebble layer along the river, the groundwater type is submersible, and the single-well water output of the motor-driven well is 10-20t , Due to the continuous reduction of the exploitable amount in recent years, the total exploitable amount of the water supply project is about 300m³/d, and the water volume does not meet the water supply demand. In addition, the water pollution incident that occurred in 2013 also proved that the use of groundwater in residential areas for the masses is extremely risky, because the risk of regional groundwater pollution increases.

According to the survey, the dew point of the spring water and the amount of ground water are relatively small, and it is impossible to drink it in a large area, and there is no long series of observation data. According to the actual measurement, the total utilization of spring water is about 100m³, and the water volume is far from meeting the regional water supply demand.

To sum up, it is the best water source plan to use high-quality surface water from Yukou as the water source for this emergency water supply project.

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