Ultrafiltration for Drinking Water

GEMÜ Valve technology for Clean Drinking Water

The supply of clean drinking water poses major challenges for water suppliers, especially in countries with low rainfall such as Kazakhstan. The waterworks in Stepnogorsk underwent a complete overhaul in 2020 to meet the requirements. The company InterTech System (ITS) implemented the project. The modern plant with ultrafiltration process is designed for 48,000 m³ per day to supply over 60,000 residents.

The Challenge

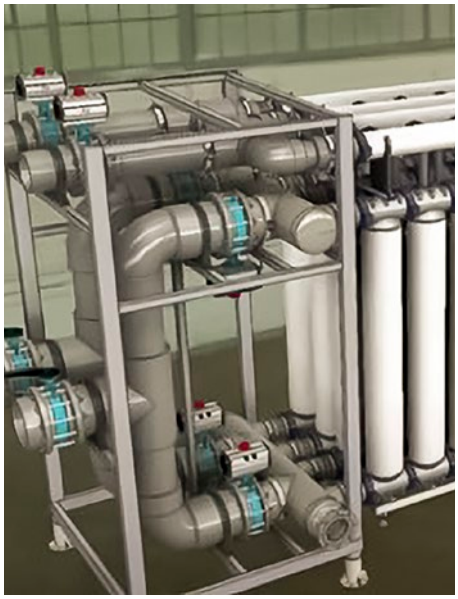
The city of Stepnogorsk is located in northern Kazakhstan and is characterized by mining and heavy industry. The groundwater is therefore heavily contaminated. The source of water supply for the low-precipitation region is the Seletinsky reservoir. Annually, 15-17 million m³ of water is collected from the reservoir to supply all settlements, cities, and businesses. In order to improve the quality of drinking water and increase the efficiency of treatment, the Sopka-305 water treatment plant in the city of Stepnogorsk had to be modernized. For the first time in Kazakhstan, the most advanced urban-scale ultrafiltration technology should be implemented.

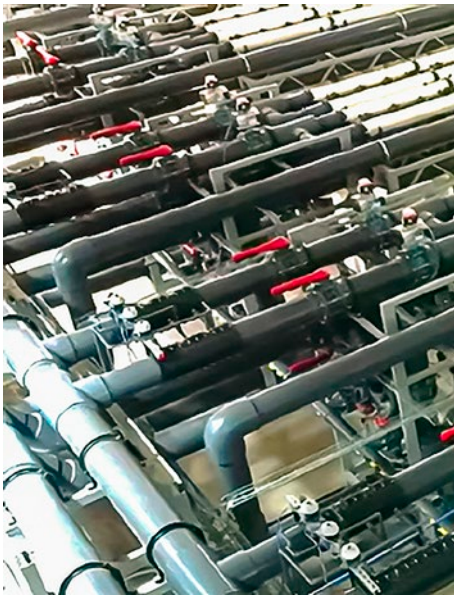
Process Description

The planners of the company InterTech System (ITS) from Kazakhstan took on the project for the renovation of the water treatment system. The modernized station was equipped with a two-stage ultrafiltration system. It is designed for 48,000 cubic meters per day, which completely covers the water supply in the region. The renovated Sopka-305 will supply more than 60,000 residents with purified water.
The raw water is transported via pipes from the Seletinsky reservoir 50 km away and, after pre-disinfection, pre-cleaned with 300 µm coarse filters. This is followed by the first stage of ultrafiltration in five UF racks. The retentate is filtered again in a second UF stage to increase the yield. In addition to the storage tanks for filtrate, concentrate and backwash water, dosing stations for the chemicals for water conditioning and backwashing (acid, alkaline, disinfectant and coagulant) were installed.

Process Data

- Process media: particle-loaded surface water
- Pressure : 2 - 5 bar
- Temperature: 5 - 35 °C





Suitable GEMÜ Products

Manually operated butterfly valve
- GEMÜ R487 DN 400-600

Pneumatically operated butterfly valve
- GEMÜ R481 DN 50-200

Ball valve
- GEMÜ B42 DN 25

Pneumatically operated diaphragm valve
- GEMÜ R690

Solenoid valve
- GEMÜ 0324

Pilot valve
- GEMÜ 8506

Why GEMÜ?

Due to the high quality requirements, European manufacturers were selected as component suppliers. GEMÜ was chosen as the valve supplier because of the excellent technical support. "This installation improved the water quality by 20-30 percent," said Alexei Getmanov, director of the Stepnogorsk Vodokanal. "The station does not increase the tariff, it improves the water quality," he adds.

The uniqueness of the innovation lies in the cleaning efficiency, which makes post-chlorination, as recommended by the WHO, unnecessary. This directly affects people's health.
The system is operated fully automatically and saves resources thanks to the latest technology. Wastewater was reduced from 15% to 1.5% (water savings of 2.4 million m³/year). The use of chemicals and power consumption have also been minimized.

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6–8 · 74653 Ingelfingen-Criesbach, Germany
Tel. +49 (0) 7940 1230 · info@gemue.de