

# Meeting New Drinking Water Regulations and Increased Capacity Needs with Robust Membranes



## The challenge

Sherbrooke, a township in eastern Quebec, was required to update its aging water treatment plant, as its drum filter microstrainer system was unable to meet new drinking water regulations set by the Ministry of Environment. The plant, which serves 145,000 residents, uses source water from Lake Memphremagog. While the lake is protected and the water does not contain much organic matter, the plant's drum filters were unable to meet the new safety regulations because they were solely capable of filtering algae. Time was of the essence for a solution, as the plant was required to complete construction within Quebec's stringent deadline to secure funding for the project.

## The solution

Eager to update its aging plant, the Sherbrooke team hired regional engineering firm EXP to evaluate vacuum and pressure membrane filtration systems and direct filtration systems to determine the system best suited to meet the new drinking water regulations. The new regulations required Sherbrooke's water treatment plant to reduce turbidity by meeting limits of 0.2 NTU from the previous limits of 5.0 NTU, thus requiring the plant to deploy a much more robust system to attain compliance.

Ultimately, the Aria FLEX™ membrane system from Aria Filtra® was selected following a successful preinstall bid and a nearly 6-month pilot, in which it offered the best lifecycle costs and achieved the highest amount of water recovery (at 99.5%) compared to other systems.



*"From day one of the [Aria Filtra] pilot, the team at Sherbrooke's water treatment plant felt like a valued customer. While initially anxious about the prospect of implementing a new membrane technology—which no other cities were using in Quebec at the time—our operators were convinced within the first few days of the pilot, due to how easy the system was to operate and the noticeable high quality of the water."*

Luc Larrivee, commander in chief for water, Sherbrooke Water Treatment Plant

Initially, the Sherbrooke team was anxious about investing in innovative membrane technology, which was new at the time. However, the Aria Filtra team was transparent, providing a hands-on pilot that quickly convinced the engineers to trust the technology upon seeing system results. Critical to the pilot's success was the Aria Filtra local approach and active role. With technicians who spoke French, the local language, the Aria Filtra team avoided language barriers while explaining to operators how the system worked and helping them get comfortable running it.

## The results

Beyond needing to meet the Ministry of Environment's 0.2 NTU limits, the system had to achieve 0.1 NTU 95% of the time and 0.2 NTU 100% of the time. Reducing *cryptosporidium* and *giardia* was another key element of this project, and Aria Filtra provided 4 log reductions (beyond the 3 log reductions that were required by city). With this reduction of solids, the robust Aria FLEX system has reduced chlorination by 40%. In the winter months, Sherbrooke is able to stop rechlorination in various places across its lengthy distribution channel because colder temperatures limit bacterial growth. Furthermore, Sherbrooke's reservoirs and distribution system now require less cleaning. Tanks, which used to require cleaning every two years, now only need to be cleaned once every four to five years. The cleaning required for the distribution system has been reduced by two months per year, freeing the operators to perform more strategic tasks.

Not only was the Aria Filtra system able to meet drinking water standards and achieve compliance, but it also exceeded the plant's original capacity of 81,000 cubic meters per day (m<sup>3</sup>/d), which could no longer meet Sherbrooke's growing capacity needs caused by

population growth. The Aria FLEX membrane system is capable of producing 96,200 m<sup>3</sup>/d in its present phase and can scale to handle a maximum capacity of 101,610 m<sup>3</sup>/d.

At the initial installation, Sherbrooke added a secondary system, as the water treatment plant was approaching its maximum capacity. Originally, Sherbrooke had wanted to expand its water treatment plant in the next 20 years; however, its plant was unable to manage the excess waste that was produced. As the township didn't want to refurbish both plants at the same time, it determined that deploying a recovery system was the best way to limit costs and restrict the volume of waste from the water plant. Aria Filtra engineers customized a backwash system that would generate less waste with a higher volume concentration than the water plant could attain. The backwash recovery system is part of the design and takes water at 95% recovery up to 99.5%.

## The benefits

The robust membranes easily met the Ministry of Environment's new drinking water requirements for the Sherbrooke water treatment plant and surpassed current and future capacity needs for the township's growing population. Overall, the Aria FLEX system provided the following benefits:

- Ability to meet drinking water standards
- Reliable membranes capable of achieving the highest recovery rates
- Reduced solids, enabling monetary savings and efficiency
- Additional capacity to support future population growth
- Local customer service and technician support



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