Meeting Environmental Health Regulations While Racing Against the Spring Freshet

The challenge

In light of British Columbia's new environmental health regulations, the province's Village of Clinton needed to upgrade its surface water treatment plant. Located 350 kilometers northeast of Vancouver, the plant's previous treatment consisted solely of disinfection by chlorination. Given the Interior Health Authority's new regulations, surface water plants experiencing turbidity events above 1 NTU were required to implement a more robust filtration treatment process to remain compliant. As is typical of many small communities like Clinton—the village has roughly 650 residents—the plant upgrade had limited funds for construction and relied on grant funding. Therefore, along with their consulting engineers at TRUE Consulting Ltd., Clinton began evaluating technologies and filtration systems capable of treating for pathogens such as *cryptosporidium* and *giardia*—while racing against the upcoming freshet that occurs when snow and ice melt in rivers.

The solution

During Clinton's search for a filtration system, conventional and membrane treatment methods were considered. The plant selected the Aria FIT™ filtration membrane system from Aria Filtra® for its ability to enable the plant to meet the Interior Health Authority's "4-3-2-1-0" guideline for drinking water treatment and the consistency of treatment.

To minimize treatment costs, from an initial capital and an overall lifecycle basis, Clinton needed a treatment solution that would meet their ultimate treatment requirements from the outset, without subsequent upgrades. The Aria FIT

> *"In the two years that the Aria FIT filtration system has been running, we have not had a single instance where we were unable to meet treatment levels. The quality of the water is great, but most importantly, this system has provided peace of mind that we can check in on the plant in the morning then set the system alarms and leave it alone for the rest of the day as we fulfill our other responsibilities. The low operational demands have been crucial for us as a public works department of three."*
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> **Karl Hansen,** public works foreman, Village of Clinton

system enabled the village to utilize a direct feed coagulation process to remove contaminants from source water, along with providing a physical barrier for pathogen reduction. In this process, the main contaminants of turbidity, color, and organics can be precipitated then filtered directly by the Aria FIT system. This eliminates the need for a clarification step, which is a significant piece of equipment. Selecting the Aria FIT system kept overall project costs within Clinton's available grant allocation, and even reduced long-term operating costs.

The result

The speed at which the Aria Filtra team completed the installation process was critical, as the water treatment plant needed to be operational prior to the spring freshet. Aria Filtra had the system running within five months and beat the freshet. This allowed Clinton to treat the year's harshest water quality, which is caused by melting snow and thawing forest matter that enter the village feedwater from a local creek. In prior years during the freshet, Clinton had to issue boil water alerts and advisories, as the chlorination treatment process didn't adequately remove all the organics in the water. Following the Aria FIT implementation, the village was able to reduce chlorine consumption by 50%.

With a focus on simplicity and cost-effectiveness, the Aria FIT system met all treatment needs from the initial installation by delivering an entire process for solids and bacteria removal, while other solutions included a costly and disruptive two-stage implementation plan requiring a plant upgrade 5 to 10 years later. At a capacity of 1.8 megaliters per day, the system exceeds Clinton's current needs projected for the next 10 years—though the Aria FIT system is expandable and can easily incorporate additional modules and trains for future expansion should it need to add capacity. When putting this plant online, Clinton also built a 500,000-gallon reservoir to replace its 25,000-gallon contact tank. Between the additional capacity of the Aria Filtra system and the reservoir, the village is afforded flexibility and time before running out of water should it need to take trains down for maintenance or experience an emergency that impacts water supply.

Additionally, Aria Filtra technicians seamlessly integrated the entire system together so operators can control chlorination and filtrations systems, downstream meters, and reservoir levels from a single computer system. Having one central platform for controlling the entire plant increases efficiency and ease of use. As such, Aria Filtra provided safe, reliable water using smart solutions to simplify the Village of Clinton's water challenges.

The benefits

The high-performing, robust membrane system successfully removed solids and bacteria, allowing Clinton to meet updated Interior Health Authority regulations. Overall, the benefits of the Aria FIT system to Clinton's water treatment plant included:

- **Reliable water that meets environmental health regulations**
- **Easy-to-use, comprehensive system that incorporates pretreatment needs**
- **Smart solution for water treatment challenges**
- **Speed of deployment**
- **No need to issue boil water notice during the freshet**

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