

# Membrane Water Filtration System Brings Renewable Water Supply and Reliability



## The challenge

Castle Rock Water provides drinking water to more than 63,000 residents in the Town of Castle Rock, Colorado, and sought to transition from its reliance on nonrenewable water sources of deep groundwater wells to a renewable water supply (surface water and groundwater under direct influence of surface water). As part of Castle Rock Water's program to develop a sustainable long-term water supply, the Plum Creek Water Purification Facility faced new renewable source waters that required installing a new water treatment system to meet regulatory requirements.

## The solution

Following a pilot study using the filtration unit from Aria Filtra®, Castle Rock Water conducted a bidding process with three qualified membrane manufacturers and awarded the membrane system contract to Aria Filtra. The Aria FLEX™ system performed exceptionally well during piloting, as the system met qualitative requirements established by Castle Rock Water design engineers, and the Aria Filtra system provided Castle Rock Water with the best long-term project value.

The durability of the system and overall reputation of Aria Filtra were also determining factors beyond the quality of resulting water. The system's robust membranes allow the Plum Creek Water Purification Facility to treat water from virtually any source, which was crucial to Castle Rock Water's success because this is the only plant in its network capable of treating surface water. Given the reliability of Aria Filtra membranes and the overall filtration system, Aria FLEX provided an absolute barrier from bacteria and typical surface water contaminants, allowing the town to meet the Safe Drinking Water Act and other safety requirements.



*"The Aria FLEX membrane filtration system is at the heart of our flagship water purification facility. Beyond its durability and reliability, our ability to add capacity to the existing system has been a huge benefit as we expand the Plum Creek Water Purification Facility in order to meet the town's rapidly growing population."*

Walt Schwarz, project manager, Castle Rock Water

The membrane solution provided protection against microbial contamination while also removing organic and colloidal contaminants. Oxidized metals were removed in the pretreatment process and any remaining iron and manganese was removed through Aria Filtra filtration membranes. Beyond purification, another major objective of the new facility's design was to maximize system efficiency by minimizing membrane fouling from precipitated metals.

## The results

The reliability of the Aria Filtra membranes and quality of the membrane system has given Plum Creek Water Purification Facility operators the confidence to sleep easy. The sophisticated system automatically shuts down in instances of high turbidity to prevent contaminating the entire water supply, while simultaneously alerting the operators and self-diagnosing any issues with membranes or fibers. The strength of the membranes themselves is evident, as Plum Creek Water Purification Facility recently began pulling water directly from East Plum Creek. While there was a spike in turbidity of the water treated by the Aria FLEX system—from 9–11 NTU to 60–70 NTU—the system is still able to operate at capacity and deliver high-quality water that meets drinking water standards.

Following the success of Castle Rock Water's initial Aria FLEX deployment, which became operational in 2013, Plum Creek Water Purification Facility is currently undergoing an expansion project, as the town's population is rapidly growing and expected to double in the future. Originally built with the ability to easily scale, Castle Rock Water quickly identified the region's increasing water

needs and began planning for a plant expansion. Featuring a current treatment capacity of up to 6 million gallons per day (mgd), the Aria FLEX system, along with other treatment facility components, is expandable to 12 mgd, which will enable the town to easily meet future demand.

Additionally, the Aria FLEX water treatment system enables Castle Rock Water to transition from nonrenewable water sources to a renewable supply. "This plant represents an important step toward our goal of 75% renewable water," said Walt Schwarz, Castle Rock Water's project manager. "The [Aria Filtra] system gives us the flexibility to accommodate our growing community and accelerate our efforts as we pursue our long-term water goals." With the opening of this facility, the town has not only moved closer to realizing its stated renewable water goal, but it is also able to produce water at significant savings compared to its other facilities.

## The benefits

The durability of the Aria FLEX system and its membranes have allowed Castle Rock Water to treat and deliver safe, renewable water from surface water and alluvial wells to the town's residents and businesses. Overall, the Aria FLEX system provided the following benefits:

- **Ability to meet drinking water standards**
- **Additional capacity to support future population growth**
- **Reliable customer service and technician support**
- **Ease of operator use, with automated software and controls**



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