



## Bringing an Old Mine Back into Production

### THE CHALLENGE

The Bralorne Gold Mine, located in southwestern British Columbia, was one of Canada's most prolific mining operations in production from 1928 to 1971, when low gold prices forced miners to halt their operations. Shortly after Avino Silver & Gold Mines acquired the mine in 2014, the mine needed to be shut down due to a high water event and tailings storage freeboard concerns. Instability in the dam foundation was discovered during construction of raising the tailings storage facility dam that needed to be addressed. Temporary water storage for mine drainage would not be available during construction and required a higher-capacity water treatment for the anticipated high volume flows for freshet. Avino required a faster, more affordable and reliable treatment solution than its existing media filtration unit and one that could handle construction challenges, remove contaminants and protect local waters.

### THE SOLUTION

Avino's initial media filtration system became very costly in replacing media and had very low flow capacity of 8 liters per second (L/s). To determine a more robust solution, Avino brought on engineering firm Tetra Tech, who suggested Pall Water's Aria™ FAST mobile membrane treatment system to replace its underperforming media filter and bring the mine one step closer to becoming operational and efficient. Pall's solution was selected due to its ability to meet discharge compliance standards, enabling the mine to properly release water into a nearby river, and quick lead time for the standalone unit.

The membrane system was the only reliable solution capable of meeting British Columbia's strict environmental regulations. In addition to removing the solids and particulate matter from the water, the membrane unit could also meet the limit of 0.5 arsenic milligrams per liter demands during the peak weeks of the spring freshet. On average, freshet water flow rates from mine workings are 13 L/s and increase up to 20 L/s, but with Bralorne's maximum flow recordings nearly doubling that, Pall's mobile unit had the highest capabilities, reaching 35 L/s with no detriment to water quality at higher flow rates.

### THE RESULTS

The quick response and deployment of Pall's fully integrated Aria FAST unit allowed the gold mine to rapidly treat excess water in order to meet stringent discharge requirements and prepare the mine for

production. The Aria FAST unit was ordered, delivered and commissioned quickly delivering water within 60 days of receiving the order, with Pall technicians working closely onsite with contractors and engineers for integration with existing works. Avino decided to purchase the unit after a six month trial and relocated the trailer and system to a more permanent location in a newly constructed Water Treatment Plant.

Following complete commissioning of the plant, the full mine drainage flow was treated and discharged for environmental compliance while the dual rack system resulted in zero downtime even during commissioning or routine maintenance. Additionally, water quality of the discharge was maintained regardless of flow or inlet variables and the arsenic removal targets were highly achievable by this system.

To facilitate the installation and ensure the most effective results on an ongoing basis, Pall's Aria™ CARE team provided services throughout the installation process and has continued its support for operators through monthly remote monitoring and quarterly service visits for the first year of purchase. Operators enjoy the support from the Aria CARE customer service team as technicians are able to remotely view the system to help troubleshoot any issues in addition to providing best practices for achieving maximum system performance. As an additional benefit, the Aria FAST's self-contained backwashing system required minimal operator intervention and was both monitored and serviced remotely.

## THE BENEFITS

The speed of deployment allowed the gold mining plant to rapidly meet its environmental discharge need. Overall, the Aria FAST system provided the following benefits:

- Quick deployment and installation process to meet compliance deadlines
- Reliable, steady-state water quality results, achieving compliance with good system control
- Comprehensive, self-contained water treatment plant
- Operator-friendly system with continuous technician support



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