

Gold Mine Water Treatment Plant

CASE STUDY



Location	Battle Creek, NV
Client	Confidential
Year	2019
Industry	Mining
Application	Water Treatment Plant
Contaminants	Arsenic, Antimony, Total Dissolved Solids (TDS)
Solution	Chemical Precipitation, Ultrafiltration, Reverse Osmosis

Innovative Solutions

A large, North American mining company reached out to WaterTectonics for help designing and replacing an existing water treatment plant in Nevada. The goal was to bring the Battle Creek area gold mine up-to-date with the Nevada Department of Environmental Protection (NDEP) Profile 1 requirements. Of particular concern were: arsenic, antimony and total dissolved solids (TDS).

DESIGN & ENGINEERING

After conducting treatability testing, WaterTectonics provided detailed engineering & design including: P&ID, electrical design, mechanical design, operations manuals and documentation for equipment. Based on testing results, the existing mobile water treatment equipment was replaced with chemical precipitation, filtration (Ultraflo) followed by a proprietary media filter to remove any residual arsenic and antimony.

For most of the year, the TDS of the mine water was below the discharge threshold. However, the previous treatment system needed a reverse osmosis (RO) system to remove antimony. The WaterTectonics design was able to provide an optional RO system as part of the design that only runs when the overall TDS is above the discharge limit and then only treats a portion of the flow to meet the limit. This has nearly eliminated the need for brine storage ponds at the site and allowed the mine to cancel plans for a multimillion dollar investment in more brine storage ponds.

TREATMENT SOLUTION

The treatment train consisted of a chemical precipitation process for a 200 gallon per minute stream with an ultra-filter for the entire stream. Also included, was a mobile RO system at 100 gallons per minute in a heated, well-lit 40 foot high cube ISO container.

A key component of this project was WaterTectonics' Automated Operator System. This system incorporates control and adjustment of all system process to a single touch-screen user interface allowing the operator to quickly visualize system performance. The control system has a web interface and SCADA data acquisition system that allows the supervisor and engineers to see plant performance real-time. This includes high quality cameras on the critical components of the system.

Critical system functions are set-up on email notification to a defined user group and an escalation policy is put into place to ensure timely response to system functions can be applied to user defined activities. The system's web interface provides real-time water quality performance and generates daily reports on volume and water quality.

