



Ultrafiltration Pretreatment for Reverse Osmosis at a Silver & Gold Mine in Mexico



Client: Silver & Gold Mine, Zacatecas, Mexico

Water Treatment Capacity: 150 gpm

Challenges:

This mine aims to enhance the quality of treated wastewater in order to comply with local discharge regulations, while also maximizing water reuse within its operations. Currently, the existing physicochemical treatment process results in variable water quality, characterized by elevated turbidity levels of approximately 45 NTU, along with increased suspended solids, color, and chemical oxygen demand (COD). These inconsistencies affected the reliability of the downstream reverse osmosis (RO) system, leading to greater membrane fouling, increased cleaning frequency, and higher chemical consumption.

Therefore, the client requires a robust solution that can consistently produce high-quality water suitable for RO feed, while simultaneously reducing operational costs and enhancing the overall reliability of the plant.

QUA's Solution:

QUA's Q-SEP® Ultrafiltration was implemented downstream of the physicochemical treatment process as a polishing step and RO pretreatment solution.

The system consists of two Q-Connect™ 10012 4.0 (total of 08 membranes with 100m2 area each), providing a total treatment capacity of 150 gpm. By replacing conventional polishing processes with membrane ultrafiltration, the mine achieved significantly more stable water quality, allowing reliable operation of the downstream RO system.

Supported by strong local OEM and system integrator expertise, Q-SEP® continuously delivers high-quality permeate with low turbidity, low SDI, and stable membrane performance. The improved feed water quality substantially reduced RO fouling potential and lowered chemical consumption associated with RO membrane cleaning.

Process Diagram



Results

The implementation of Q-SEP® Ultrafiltration transformed the wastewater treatment process by providing a consistent and reliable RO feed water source. Product water turbidity remains below 1 NTU with SDI below 1.4, low color, and excellent overall water quality.

Despite challenging feed water conditions, the system maintained stable operation with TMP below 7 psi, demonstrating excellent fouling resistance and membrane performance.

By improving RO feed water quality and reducing membrane fouling, the customer achieved annual savings of up to 1,000 pounds of RO cleaning chemicals, equivalent to approximately MXN 1 million per year, while improving overall operational reliability and supporting sustainable water reuse practices.