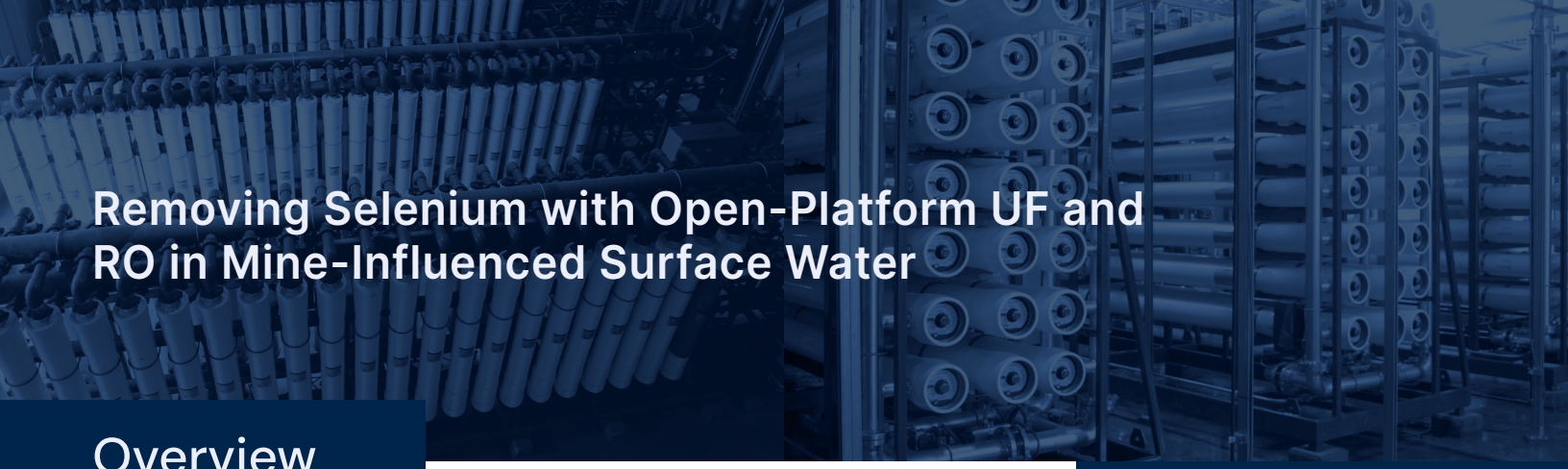

Removing Selenium with Open-Platform UF and RO in Mine-Influenced Surface Water

Overview

Selenium concentration in this mine-influenced surface water was an average of 160 ppb, well in excess of the EPA-recommended standard of 5 ppb. These elevated concentrations pose potential toxicological concerns due to bioaccumulation in aquatic species, resulting in potential reproductive and developmental deformities. Reverse osmosis (RO) was selected for this project due to its ability to achieve >99% rejection of selenium in natural mine-influenced waters where selenate (SeO_4^{2-}) is predominant.

In this project, WesTech designed and fabricated a system consisting of open-platform ultrafiltration (UF) as pretreatment to RO for selenium removal. Both packages were customized to meet stringent footprint and operational requirements, including integration to allow for RO permeate to be used for UF backwashing to reduce blended selenium concentration in the discharge.

Results

<3.0 ppb
Permeate Selenium Concentration

3+
Number of Compatible UF Modules

30%
Less Footprint Required to Comparable Systems

Project Summary

Smoky Canyon Mine Treatment System

Location:
Afton, Wyoming, USA

Application:
Selenium Removal from Surface Water

Process:
Ultrafiltration Reverse Osmosis

Size:
2,000 gpm / 2.88 MGD

Design Flux:
59.7 gfd

Highlights

- Open-platform UF system with 3+ compatible modules
- Integrated UF/RO systems processes
- Unique UF backwashing strategy for selenium compliance
- Limited chemical and energy consumption

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