

## Mining and Metals: US Phosphate Mine and Chemical Plant

### Project specifics

- + Plant size: 3 x 2-stage brackish water reverse osmosis plants each with a capacity of 550 gpm (3,000 m<sup>3</sup>/d)
- + Feed water: From wells with high silica levels of 60-70 mg/l
- + Recovery: 70 %
- + Process: RO

### The challenge

This large, vertically-integrated phosphate mine and chemical plant in the USA uses eight boilers to meet its steam requirements.

A state-of-the art reverse osmosis (RO) membrane system was installed in 2009 to improve the feed water. However, despite the use of a silica-specific antiscalant, the membranes needed to be cleaned increasingly frequently.

### The Genesys solution

When assessing the site in 2016 we realised that ineffective cleaning was the main cause of the increased silica fouling, which had in turn prompted more frequent cleaning.



Genairclean cleaning test rig

Membrane Mine  
Master software



### Innovation

We use our robust knowledge of membrane fouling to design client-specific antiscalant and cleaning regimes, based on our innovative products and technologies.

Our range of antiscalants help to maximise recovery and our GenMINE™ cleaning range helps to reduce cleaning duration and frequency. Furthermore, our innovative Genairclean™ method uses dual generation air-bubble technology to improve membrane cleaning efficiency.

Forensic analysis of membranes from operational plants, led by the team at our recognised centre of excellence in Madrid, enable us to provide mining companies with tailored solutions to optimise plant performance.

### Sustainability

We have a verified track record of treating challenging, variable effluent mine waters, ensuring that mining operators protect the environment.

In addition to cleaning water for reuse in the mines, where possible, we enable them to supply potable water to their own camps and even surrounding villages.

### The results have included

- ✓ Shorter cleaning programme
- ✓ Quadruple the level of silica removed during cleaning
- ✓ Reduced cleaning frequency due to cleaner membranes
- ✓ Improved plant availability