

CASE STUDY

Industry:
Mining

Mine Water Reclamation in Inner Mongolia

Application Overview

Efficient reclamation of coal mine wastewater is essential for sustainable water management, particularly in arid and industrial regions like Inner Mongolia, China. Coal mining operations generate significant volumes of wastewater containing suspended solids, oil residues, and dissolved contaminants, which require effective treatment to enable reuse or safe discharge.

In 2022, a 200 m³/h ultrafiltration (UF) system utilizing PolyCera® Hydro membranes was commissioned to improve water recovery rates and ensure stable pretreatment for downstream reverse osmosis (RO) processes.





Process Design

The PolyCera® Hydro UF membrane system was selected due to its ability to handle challenging wastewater conditions, including high turbidity and oil content. The treatment process includes:

1. Mine Wastewater Intake: Raw coal mine wastewater enters the treatment system, often containing 50–500 ppm TSS (total suspended solids).

2. PolyCera® Hydro UF Membrane Filtration:

- Removes suspended solids, oil, and microbial contaminants.
- Ensures a stable and high-flux operation without frequent downtime.

3. Downstream Reverse Osmosis (RO):

- Receives pretreated water, benefiting from the consistent quality and reduced fouling potential provided by PolyCera® UF.

4. Water Reuse or Discharge:

Treated water meets the required quality standards for fire protection, dust suppression, and industrial reuse.

Results

The implementation of PolyCera® Hydro UF membranes resulted in:

- High System Recovery: >90% total water recovery, significantly reducing wastewater disposal volumes.
- Stable Water Production: The system maintained continuous 200 m³/h operation at design conditions.
- Enhanced Downstream Performance: Reduced RO fouling led to improved efficiency and lower operational costs.
- Process Optimization: Eliminated the need for conventional sand filtration and coagulation, simplifying operations and reducing footprint.

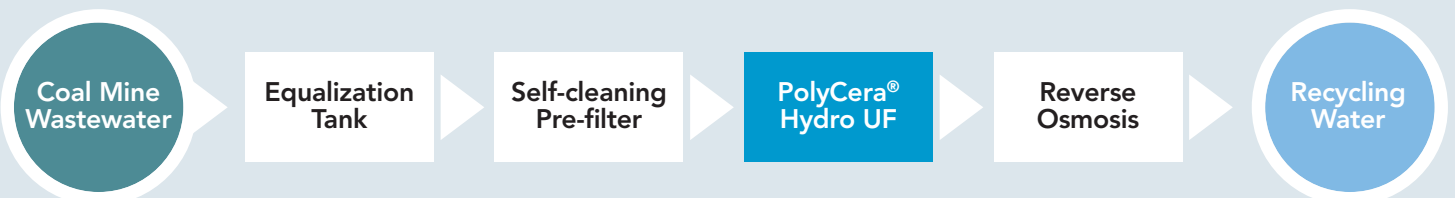
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Conclusion

The successful deployment of PolyCera® Hydro UF membranes for coal mine wastewater reclamation in Inner Mongolia demonstrates the technology's reliability, efficiency, and sustainability benefits. The system's ability to achieve >90% recovery, reduce operational complexity, and lower maintenance costs makes it a preferred solution for mine water treatment worldwide.



Process Flow



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