

Case study: Triton-Compact-MBR system for wastewater treatment (WWT) in mining

Triton Water AG

Triton Water AG is a well-known and reliable partner in the water and wastewater treatment space on maritime vessels and on-shore. With more than 1,500 installations since 1851, Triton Water AG is one of the leading German middle-sized companies with more than 80 qualified employees. We provide best-in-class solutions across the full water cycle through leading technologies.

K+S Kali GmbH

K+S KALI GmbH is one of the world's leading potassium mining companies, with a share of 12 percent. One of the production sites is Hattorf/Wintershall in Germany. It offers aboveground employment to approximately 550 employees, while more than 1,250 work underground. The overall size of these mines is comparable to the city of Munich.

The Challenge

The workers underground use chemical toilettes for their daily needs. Afterwards the wastewater is collected and transported via a lift aboveground, instead of transporting commodities which makes the wastewater handling quit expensive. Triton Water AG was assigned by K+S to install a cost efficient and reliable solution.



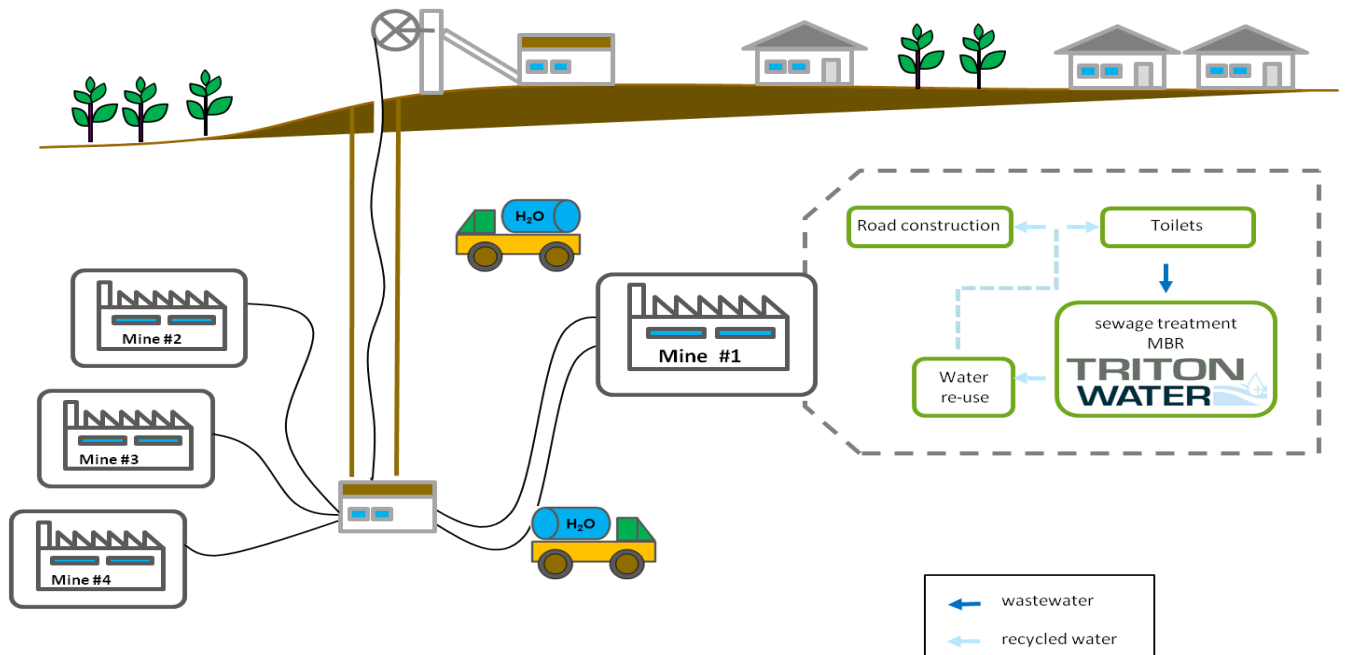
The solution

Triton Water developed a new and highly efficient sewage treatment system for the industrial and municipal wastewater market based on ultra filtration technology. In a so-called membrane bioreactor system (MBR) the activated sludge process is combined with a more sophisticated membrane separation process. Higher effluent quality can be reached as a result of the absolute barrier for particles provided by the membrane.

The collected wastewater from the mixing/equalization tank is treated before entering the MBR system. Due to the unique properties of the ceramic membrane an intensive pre-treatment with rack and fine screen is not necessary. A macerator pump grinds waste and larger particles to a small particle size in order to avoid the clogging of the membrane pores. These particles will be removed from the system via the excess sludge removal. An additional waste stream is avoided. The heart of the system is made up of the submerged ceramic flat membrane plates which are arranged in modules in the bioreactor. A filtration pump sucks the cleaned water (Permeate) through the membranes, in which solid substances and microorganisms are held back due to the pore size. As a result the permeate has bathing water quality. The recycled water is reused by K+S for their underground road constructions.

Parameter	Dimension	Intake	Permeate
COD	mg/l	6960	43
BOD₅	mg/l	1790	< 5
E. Coli	CFU/100mL	> 10 ⁶	0
Enterococci	CFU/100mL	> 10 ⁶	0
Coliform bacteria	CFU/100mL	> 10 ⁵	0

Graphics: Triton-Compact-MBR system for WWT in mining



Triton-Compact-MBR advantages:

- excellent discharge values with EU Bathing water quality
- high bacteria and virus removal rate
- compact and modular design
- one step process
- small footprint
- odour free
- water recycling for:
 - irrigation
 - process water
 - road construction

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