CASE STUDY

Water Source Reclaimed stormwater
Treatment type UF
Industry Zoo
Service Cleaning Study
Chemicals AWC UF-428

AWC Provides Cleaning Solution For Ultrafiltration System at the Cincinnati Zoo

The Facility

The Cincinnati Zoo uses an Ultrafiltration System (UF) to treat stormwater. The reclaimed water is collected from 14 acres of the park, including parking lots, animal exhibit yards, rooftop drains and walking path storm drains. Those sources are combined and run through a straining basin to a 300,000 gallon retention tank system. From there, the water is pumped from a wet well to the UF system, producing irrigation water and make-up water for various animal exhibits. These include underwater viewing of Polar Bears and Sea Lions, as well as moats for Lions, Cheetahs and African Painted Dogs.

UF Model	DIZZER XL 1.5 MB 60 W
Membrane Type	Tubular
Surface Area (ft^2)	645
Filtrate Flux (gfd)	35 -105
Operating TMP (psi)	0 - 20

The Problem

The UF storm water recovery system was showing a drastic deterioration in product flow. A service company that was contracted performed an extensive cleaning. They first recirculated a competitor's acid cleaner at a pH of 1.6 for two hours, followed by an alkaline cleaning at pH 12.8. The high pH cleaner was few more hours with a fresh alkaline solution at pH 12.4.

The system was finally cleaned with a second acid solution for another hour. The Transmembrane pressure (TMP) and flow did not recover to design values. Within a few days, the product flow started to decrease again until the UF system's operation had to be completely halted.

	Total	Post Cleaning using Competitors' Product
TMP (psi)	25 psi	11.5 psi
Flow / module	6.875 gpm	20 gpm

The Solution

The Cincinnati Zoo operations team requested AWC's assistance in finding a solution to properly clean their UF elements. A cleaning study was performed and it was determined that a 2% solution of AWC UF-428, a high pH chlorinated cleaner, should be used at a pH 12.

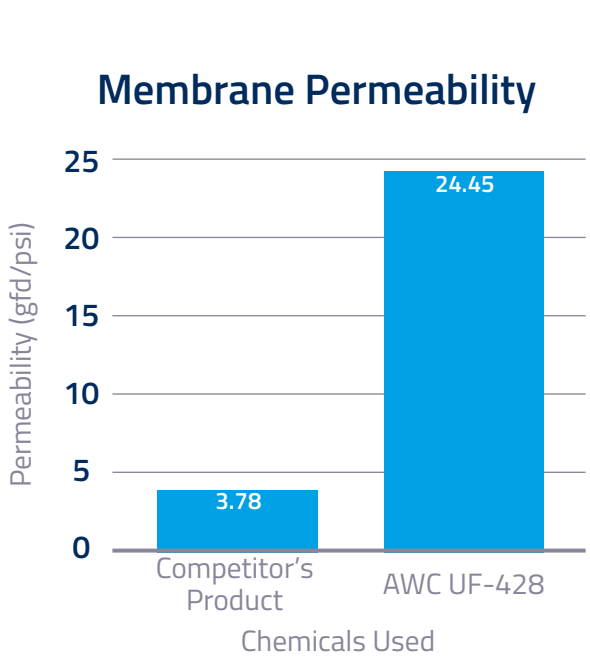
The most effective cleaning protocol consisted of alternating forward and reverse circulations with soaking for a total of 6 hours.

These recommendations were implemented in cleaning the remaining modules. As a result, the UF membranes were revitalized with a 20 fold increase in flux and an 87% decrease in TMP.

	Total	Post Cleaning using AWC UF -428
TMP (psi)	30 psi	4 psi
Flow / module	16.5 gpm	43.8 gpm

The Results

AWC cleaning study enabled the Cincinnati Zoo to resume operation of the UF system at optimum performance, thereby allowing the zoo to handle the stormwater runoff.



About AWC®

AWC is a solutions provider for the water treatment industry. The company offers an extensive portfolio of membrane chemicals specifically targeted to the needs of its global clients. Some of these chemicals include antiscalants and cleaning chemicals for Reverse Osmosis (RO), Nanofiltration (NF), Ultrafiltration (UF) and Microfiltration (MF). In addition, the company provides a broad range of analytical services including membrane performance testing, cleaning studies and membrane autopsies. The company's service offerings complement the chemical product line and offer unique tools for identifying the exact nature of a scale or foulant. Lab scale simulations are conducted to insure successful scale inhibition and optimal performance of RO/NF membrane systems during full scale operation or piloting.