





Fresh water supplies are severely stressed and access to safe drinking water becomes a greater challenge each and every day. It is imperative we protect what fresh water we have access to and ensure health and safety is never compromised. As more and more toxic chemicals contaminant our water, the need for new approaches to ensure safe and clean water has never been more critical. Let's block these harmful chemicals from entering our drinking water with SiC!

With rapidly ageing infrastructure, clearBLOX systems are perfectly suited for upgrading/re- trofitting conventional gravity filter plants to meet current drinking water demands. clearBLOX ensures our water is safe and that we never have to compromise our health. clearBLOX protects us from today's most toxic pollutants by creating new treatment approaches and solutions for water.





BENEFITS OF clearBLOX INCLUDE:

- Performance and effluent quality independent of incoming feed
- Eliminate polymers Maximize water recovery Increase capacity of
- existing hollow fiber plants Lowest SDI (RO pre-treatment) DOC/THM
- pre-cursor removal Remove complex organic compounds such as
- pharmaceuticals or PFAS Minimize or reduce post disinfection
- requirements Lower downstream treatment (RO, UV, etc.) costs
- •
- ____

clearBLOX IS USED IN THE FOLLOWING APPLICATIONS/MARKETS:

- Conventional gravity filter retrofit Filter backwash
- recovery Metal, including radium, removal from
- · groundwater BWRO pre-treatment and SWRO pre-
- treatment Surface water filtration for potable water.
- Submerged hollow fiber plant retrofit

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HOW DOES SiC OPERATE?



A slight vacuum is applied to the membrane to pull water through the 0.1 micron membrane pores. SiC is one of the few membrane matrerials that is naturally and permanently hydrophilic, meaning organic foulants, including oil, are repelled by the membrane while water is naturally drawn in. SiC is also chemical inert and extremely hard, meaning most anything can be used to clean it.

Solids, pathogens, and other contaminants are blocked by the membrane pores and are retained on the surface. Periodically, water is reversed back through the membranes to dislodge and remove solids that have accumulated on the surface. In some applications, air is bubbled up in between plates to provide a scouring action which further helps keep the membrane clean. Various types of spray washes can be employed to quickly and effectively remove solids from the membrane surface. While this regeneration procedure may sound quite normal for a membrane, SiC is far superior to all others.



SiC is an ultrafiltration flat plate membrane used in water and wastewater applications. With a 0.1 µm pore size, SiC creates a physical barrier blocking solids, pathogens, heavy metals, and oil & grease.

RESILIENT MEMBRANE

clearBLOX system utilize FX series modules which were designed specifically for applications like drinking water where shrinking the membrane basin down is critical. The FX series modules have a unique cleaning process which consists of an automated spray wash, or sprinkler, system to remove deposited solids from the membrane surface.

Here's how a typical clearBLOX system works for drinking water:

- 1. At the start of each backwash cycle, the membrane basin is drained.
- 2. Both the backwash and sprinkler systems are activated
- 3. Solids are fully removed from the membrane surface and flushed from the basin.











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HOW DOES IT WORK?

clearBLOX is a submerged ultrafiltration membrane processes used to treat ground water, surface water, as well as sea water for drinking water applications. Depending on the source water and treatment objectives, various chemicals, such as coagulants or oxidants, are added to the influent prior to the membrane basin. In some cases SiC can be combined with powdered activated carbon to effectively remove organic compounds, such as DOC and PFAS, by creating a targeted cake layer on the membrane surface.



Drinking water sources contain numerous compounds that can impact long term, sustainable membrane permeability. Whether it is organic material, TSS spikes, or heavy metals, drinking water membrane systems encounter numerous fouling mechanisms that require different cleaning approaches. clearBLOX has the most effective set of fouling mitigation methods to ensure membrane performance is stable over its entire life regardless of feed quality, which is only made possible with SiC membranes.

Method	Backwash	Air Scour	Sprinkler Wash	Pressure Wash	Chemical Cleaning
Purpose	Solids removal	Solids removal	Solids removal	Dewatering removal	Organic, scale, metals removal
Frequency	30 min	Continuous or	Daily to weekly	As needed	Monthly to yearly
	to 24 hrs	during backwash			

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RETROFIT OF GRAVITY FILTRATION PLANTS

Conventional drinking water plants struggle when influent conditions have changed from the original basis of design. Increases in both TOC and TSS require more and more chemical addition, in the form of coagulant and polymer flocculant, with no guarantee of achieving required treatment goals. clearBLOX system are able to achieve not only a much higher quality effluent than conventional systems, but do so even when influent conditions change. clearBLOX is also able to improve water quality without needing polymers. Regardless of what comes into the plant, clearBLOX will always meet effluent requirements. The small footprint and ability to retrofit sand filter basins also allows clearBLOX to increase plant capacity by



1. Remove the media and support gravel

- 2. Remove the underdrain system and associated piping
- 3. Remove or demolish the wash water troughs
- 4. Remove the surface wash system (not shown)
- 5. Remove the internal air scour piping
- 6. Repair and restore the concrete walls and surfaces

UNMATCHED PERFORMANCE

Due to the hydrophilic and porous nature of SiC, clearBLOX system have the highest sustainable flux rates in drinking water applications. This ensures an extremely small footprint at a low total cost of owership

SAFE

DRINKING

WATER NO

MATTER

WHAT



The SiC membranes in a clearBLOX system create a physical barrier barrier, effectively removing solids, bacteria, pathogens, and other contaminants. The result is a potable water quality that exceeds all regulatory requirements.

PARAMETER	EFFLUENT QUALITY / REMOVAL RATE		
Turbidity	<0.1 NTU		
Total Suspended Solids	<1.0 mg/l		
SDI	<2.0		
Iron	<0.02 mg/l		
Manganese	<0.02 mg/l		
Bacteria	<2.2 MPN/100 ml		
Color	<15 Pt-Co.		
Radioactive isotopes	>99% removal		
Transparent Exopolymers	>99% removal		
PFAS, DOC, VOC	>99% removal		

When combined with powdered activated carbon (PAC) to form a cake layer on the SiC membrane surface, dissolved organic compounds, PFAS, and other contaminants of concerned can be removed.

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