

## SafeGuard™ H2O In-situ Reagent Generation Technology



Bulk chemicals are used to support a range of water and wastewater treatment processes. However, bulk chemicals have a significant carbon footprint; they are delivered to treatment plants, stored and used as needed. Supply chain disruptions have threatened the integrity of water treatment operations, where lack of key treatment chemicals prejudiced those operations and their capacity to meet regulatory standards for drinking water and wastewater effluent.

The toxicity and hazardous nature of these chemicals, coupled with supply chain disruptions, inflationary price increases and a growing awareness of the lack of adequate quality controls and certification of these bulk chemicals are driving utilities to seek alternative, more carbon neutral and environmentally sustainable treatment methods.

SafeGuard™ H2O is an advanced on-site, on-demand, automated non-toxic reagent generation system that is advancing the treatment of inorganic and trace metal contaminants and supporting carbon reduction targets by replacing the need to deliver and handle toxic bulk chemicals to treatment plants. On-site reagent generation is an affordable, non-hazardous and environmentally sustainable solution — providing a 60% cost savings and a rapid return on investment.

The novel in-situ process produces reagents at a cost demonstrated to be significantly below that of the same reagents delivered in bulk form. Additionally, by generating these essential chemicals on-site, the exposure to disruptions in their supply chains for bulk chemicals is significantly reduced. SafeGuard™ H2O can be powered by renewable energy sources, and the reagents can be stored safely to enable electricity load balancing by end-users.

SafeGuard™ H2O is designed to remove a wide range of heavy metals and nutrients from water and wastewater as well as inhibit lead, copper and iron corrosion in water transport systems.

As

Cr(VI)

Cu

Fe

H<sub>2</sub>S

Hg

Mn

P

Pb

Se

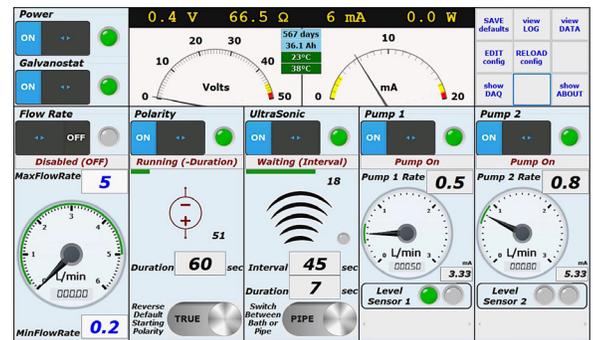
The fully automated SafeGuard™ H2O technology uses a certified precursor and an in-situ electrolytic generator to create a non-toxic reagent onsite and on demand. The process is simple, effective and carbon neutral.

SafeGuard™ H2O features automatic dosing and incorporates proprietary continuous, real-time monitoring of inorganic and/or trace metal levels at the influent and effluent to ensure optimal treatment and compliance with regulatory and operational targets 24/7/365. Because the system can be fully controlled, monitored and optimized remotely, the presence of personnel on site for supervision is minimized, further reducing operating costs compared with traditional bulk chemical treatment systems.

**SafeGuard™ H2O**

*In-situ, Electrolytic Reagent Generation*

- Fully automated in-situ reagent generation system that includes real-time online inorganic and/or trace metal contaminant monitoring
- Certified precursor ensures the quality of the reagent
- Compact modular design easily integrates into existing infrastructure
- Low power consumption, supports carbon reduction goals
- Eliminates transportation of bulk chemicals
- Eliminates supply chain risks (political, environmental, industrial)
- Process eliminates Health & Safety risks and special handling requirements of bulk chemicals



Market	Application	Arsenic	Chromium (VI)	Iron/Manganese	Lead/Copper	Mercury	Selenium	Cadmium	Iron/Copper	Hydrogen Sulfide	Phosphate	TOC	Biocide
Cooling & Heating Systems	Anti Corrosion								•				•
Municipal	Groundwater sources	•	•	•		•				•	•		
	Surface water sources											•	
	Wastewater									•	•		
Residential	Anti Corrosion				•								•
Industry & Energy	Process Effluent	•	•			•	•			•		•	
Mineral Mining	Leaching & Byproducts	•	•	•	•	•	•						
Semi Conductor	Process Effluent	•			•								•
Photovoltaics	Process Effluent	•					•	•					

On-site reagent generation technology replaces bulk chemicals including Ferric Chloride, Ferric Sulfate, Orthophosphates, Organosulfides, Oxygen, Alum and more.

Table 1. The Multiple Markets and Applications of On-site Reagent Generation

• Resource Recovery