

## SafeGuard™ H2O In-Situ Ferrous/Ferric Generation System Poised to Displace Bulk Chemicals for Phosphate Removal



High presence of phosphorus, usually in the form of phosphates, in lakes and natural waters creates a nutrient-rich environment that can lead to eutrophication, causing an excessive growth of algae and other simple plants. These high nutrient loads in surface water can suffocate ecosystems by creating dead zones (low-oxygen water) in which aquatic species cannot survive. Harmful algae blooms pollute surface waters by producing toxins that are dangerous to human health. Eutrophication also prevents lakes and natural waters from being used as a source of drinking water or for recreational purposes. Consequently, progressively tighter regulations have been introduced to reduce the nutrient load and better control phosphorus levels being discharged from wastewater treatment plants.

Traditionally, the removal of phosphate is achieved by dosing wastewater with ferric chloride or ferrous sulfate. These chemicals coagulate (bind) with phosphates to form ferric phosphate which precipitates and can be removed as sludge from the wastewater being treated. These two coagulants have a significant carbon footprint; they are delivered as bulk chemicals to wastewater treatment plants, stored and used as needed. 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.

[AMS](#) has developed a fully automated in-situ ferrous/ferric generation system — SafeGuard™ H2O — to provide utilities, large to small, with an affordable, non-hazardous and environmentally sustainable solution for phosphate removal. On-site reagent generation delivers 60% cost savings and rapid ROI. This novel technology uses a certified iron precursor and an in-situ electrolytic generator to create a ferrous/ferric reagent onsite and on demand. The process is simple, effective and sustainable.

## AMS Phosphate Removal Solution

With SafeGuard™ H2O, the ferrous/ferric reagent concentrate is produced in a highly intensive and stable manner that ensures maximum autonomy of the system. The system generates the reagent within the side stream of the treated water flow in the form of a concentrate, which can be re-injected into the treated flow or stored for redundancy and peak demand. The technology uses between 0.1 to 1% of total water flow to produce the reagent with a typical ferrous dose of 5 ppm or greater. Its modular process design easily integrates into existing infrastructure; there are no health and safety risks or special handling required.

SafeGuard™ H2O features automatic dosing and incorporates proprietary continuous, real-time monitoring of phosphate 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. This makes SafeGuard™ H2O particularly suitable for smaller wastewater treatment plants that do not have employees who are specifically trained to operate bulk chemical-based systems or have the capacity to cope with supply chain disruptions to which they are especially vulnerable.

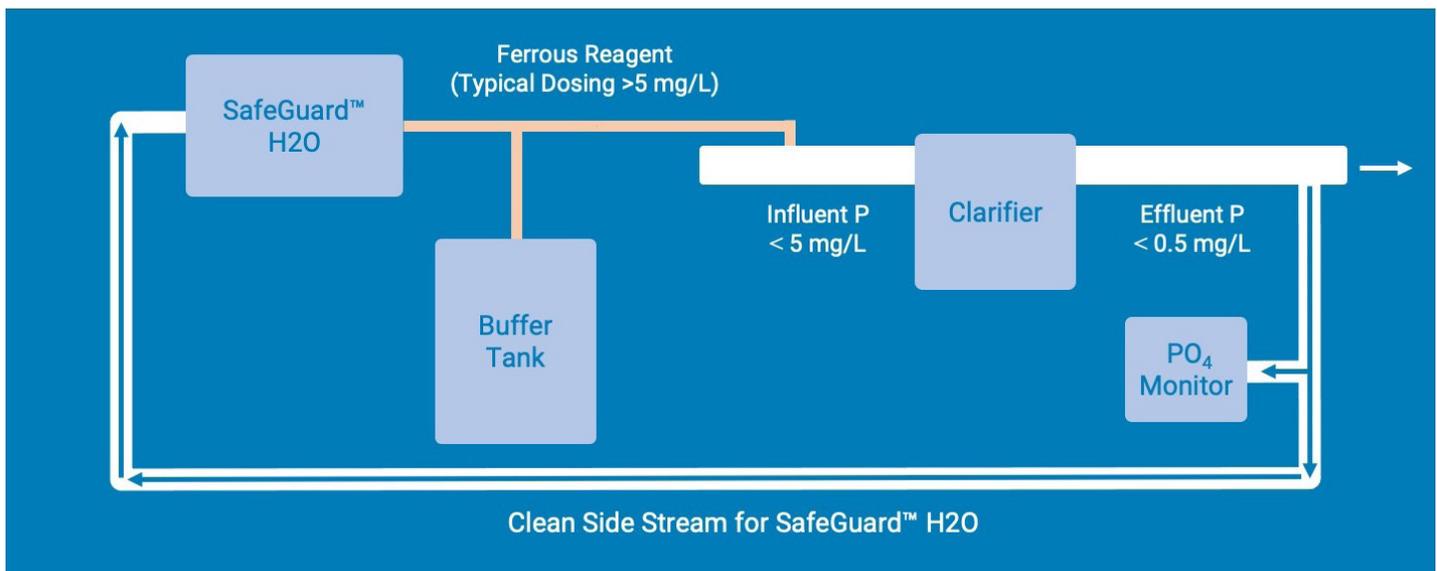


Figure 1. SafeGuard™ H2O Phosphate Removal Process

### SafeGuard™ H2O

#### *In-situ, Electrolytic Ferrous/Ferric Generation*

- Fully automated in-situ ferrous/ferric generation system that includes real-time online phosphate monitoring
- Certified iron 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 ferric chloride