

SafeGuard™ H2O In-Situ Ferrate 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 Phosphate Removal Solution

AMS' SafeGuard™ H2O is a fully automated in-situ ferrate generation system that uses a certified iron precursor and an in-situ electrolytic generator to produce a high-purity ferrate reagent on-site and on demand. The process is simple, effective and carbon neutral. This disruptive technology provides facilities with an affordable, non-hazardous and environmentally sustainable solution for phosphate removal without any of the process limitations found in bulk chemicals or electrocoagulation.

With SafeGuard H2O, a high-purity ferrate reagent is produced in-situ through a fully automated process (Figure 1). The ferrate reagent is generated as a concentrate that can then be injected into the treated flow at various locations in the wastewater process. The system features automatic dosing and incorporates proprietary continuous, real-time monitoring of phosphate levels 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 treatment systems. This makes SafeGuard H2O particularly suitable for smaller wastewater treatment plants that do not have employees specifically trained to operate bulk-chemical systems or the capacity to cope with supply chain disruptions.

The modular process design easily integrates into existing infrastructure; there are no special health and safety risks or special handling required. In addition to full-scale units, SafeGuard H2O is available in a compact, easy-to-use small-batch system. Frozen ferrate reagent sample test kits are also available for application testing.

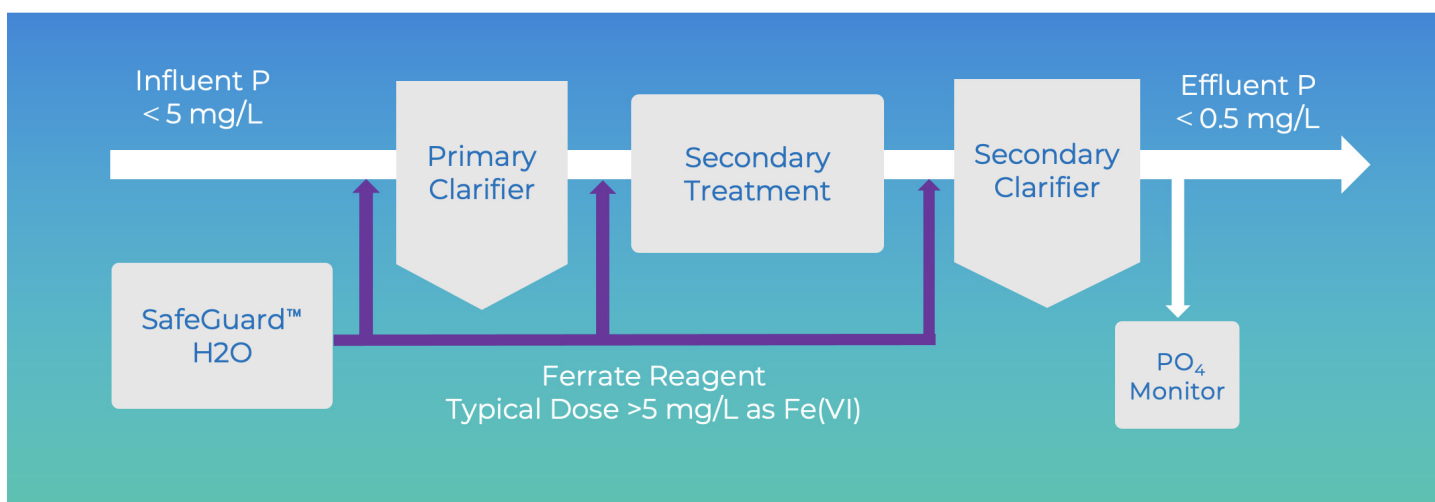


Figure 1. SafeGuard™ H2O Phosphate Removal Process

SafeGuard™ H2O In-Situ Ferrate Generation System

- Fully automated in-situ ferrate generation system that includes real-time online phosphate monitoring
- Unique phosphate removal mechanisms, particulate formation and sludge settling
- Effectively addresses organophosphate, allowing for reduced effluent levels
- 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