



Water Warriors Inc | Phosflow™

Country of Origin: USA

Technology Readiness Level: 9 - Fully commercial



Description: Phosflow is a Poseidon technology that utilizes pellets to adsorb phosphorus from water. The pellets are insoluble, environmentally safe to use and capable of capturing nutrients that can be reused as slow-release fertilizer. Water Warriors' Poseidon pellets require little to no infrastructure expansion or capital investment. Water simply passes through the pellets, leaving phosphorus and ammonia behind. The solution is versatile and scalable from very small to very large applications and offers multiple avenues for nutrient reuse. High levels of phosphorus from agriculture and stormwater runoff causes algae to grow at a remarkable rate, which harms water quality and natural habitats - a process called eutrophication. Poseidon technology uses a proprietary, all-natural material specifically designed to adsorb phosphorus before it causes harmful algal blooms. The pellets react with the nutrients in the water and form nutrient-rich crystals within the porous structure. Phosflow is utilized in a variety of applications including wastewater treatment plants, agricultural entities, aquaculture facilities, waterway restoration and stormwater systems.



Applicability to Urban Swim Sites: Water Warriors is focused on making the world's freshwater bodies and oceans safer and cleaner through innovative, new products designed to revolutionize how water professionals remove harmful nutrient pollution from waterways. Poseidon pellets have an immediate impact, reducing nutrient contamination that causes algal blooms. Phosflow directly protects oceans and waterways from nutrient runoff.

Technical Risk and Case studies: Phosflow is a commercially available product with testing sites in seven countries worldwide. The Rockdale, Wisconsin Wastewater Treatment Plant began a pilot on April 29, 2022. A sidestream of 0.063 L/s entered a 250 L drum at the bottom creating an upflow through a bed of roughly 109 kg of Phosflow pellets before exiting near the top of the drum. This was a continuous flow set up in which water was flowing 24 hours a day and 7 days a week. The anticipated contact time with the water and the Phosflow pellets was 30 minutes. The results showed as high as 83% removal of phosphorus, bringing phosphorus concentrations from a range of 4 mg/L - 5 mg/L to below 1 mg/L. When a second 250 liter drum was introduced to the process on August 23, 2022, phosphorus removal improved to 96% reduction bringing discharge phosphorus concentrations to 0.2 mg/L.

Cost & Business Case: Minimal capex is required to implement use of the pellets. All that is required is a containment structure that can hold the pellets and allow the water to flow through, e.g., wire cage, gabion, filter basket or plastic drum. Indicative Opex is A\$300 per kg of Phosphate removed. Lower price for higher volumes.

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