



The Only Nutrient Recovery Solution That Prevents Digester Struvite Build-Up

Ostara's WASSTRIP® technology diverts nutrients from sludge processing enabling up to 50% of plant influent phosphorus to be recovered



WASSTRIP® Process

The WASSTRIP (Waste Activated Sludge Stripping to Recover Internal Phosphate) process is designed to release nutrients - phosphorus, magnesium and potassium (PO_4 , Mg, K) - from waste activated sludge (WAS) produced in an enhanced biological phosphorus removal (EBPR) process prior to anaerobic digestion.

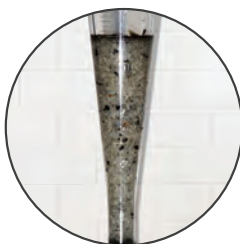
Simple in design and operation, WASSTRIP consists of a mixed tank maintained in anaerobic conditions that facilitates the natural phosphorus release process.

Subsequent sludge thickening diverts released PO_4 and Mg in the thickening liquor, which is then recovered by Ostara's Pearl® process.

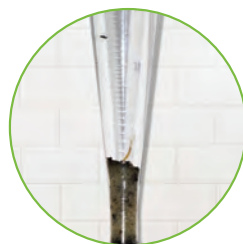
Key Benefits

Diverting PO_4 , Mg, and K ions around digestion and directing them towards nutrient recovery reduces struvite formation in the digester, reduces biosolids production, and improves sludge dewaterability. WASSTRIP helps utilities sustain asset performance while saving on maintenance, chemical, and sludge disposal costs.

WITHOUT WASSTRIP



WITH WASSTRIP



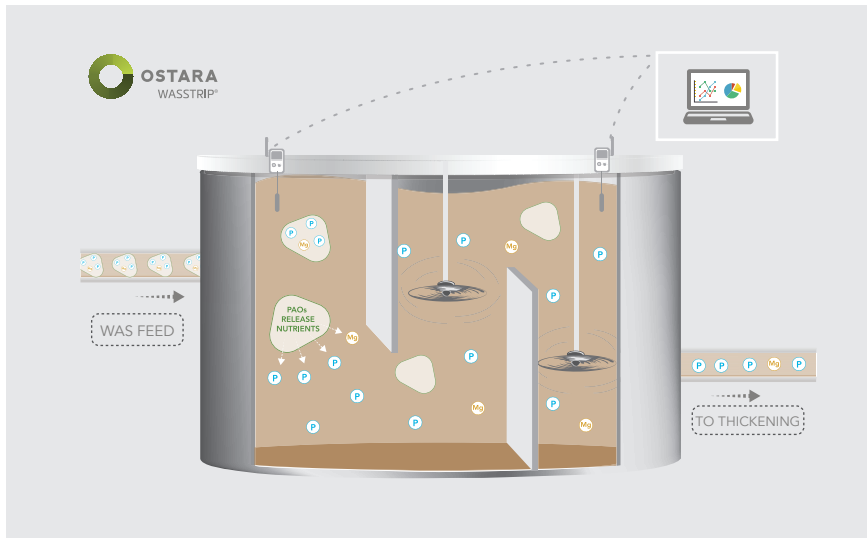
WASSTRIP significantly reduces struvite formation in anaerobic digestion. Photos compare relative volume of struvite with and without WASSTRIP.

	WASSTRIP® Benefits*
1	Maximize P available for recovery
2	Reduce struvite in digesters by up to 90%
3	10-20% reduction in net sludge production
4	Up to 4% increase in cake solids (corresponding to approximately 20% volume reduction)
5	Reduced polymer consumption by 5-20%

Additionally, by rerouting PO_4 and Mg to the Pearl, WASSTRIP enables utilities to achieve maximum resource recovery and earn revenue through the sale of high-value recovered fertilizer.

*Data collected from operating Ostara sites. Please contact us for more information.

Standard WASSTRIP Tank Design

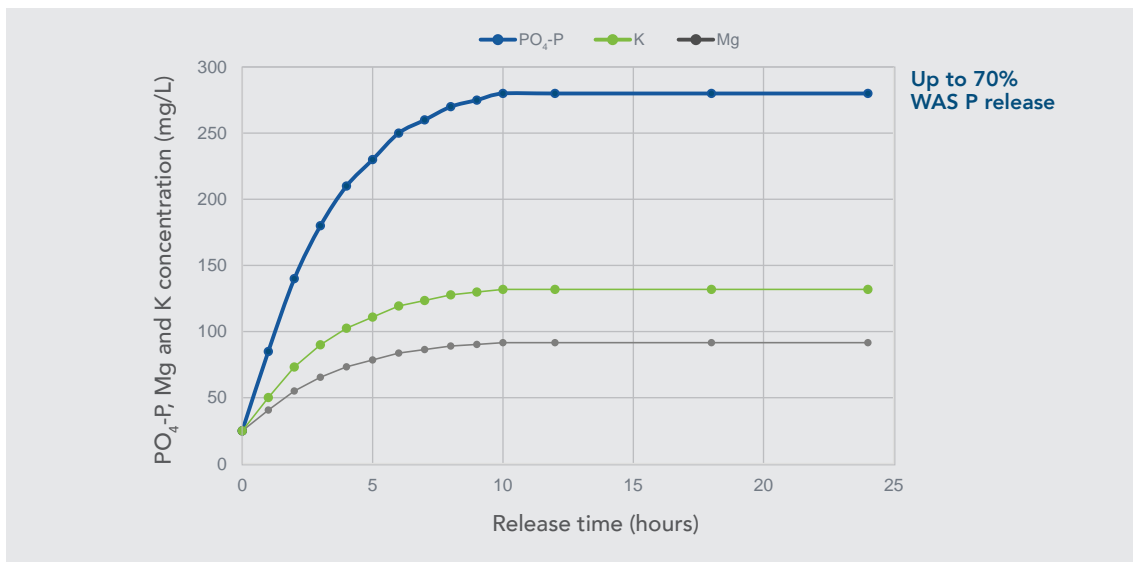


Flexible, Efficient System Construction

The WASSTRIP solution is customized to your plant's specific biological processes. Phosphorus and magnesium release testing is used to develop a solution with a specific hydraulic retention time and feed mixture. System layout is highly flexible, leveraging existing assets where possible. System tie-ins include standardized mixing and monitoring equipment. We will work with you to identify the optimal configuration for your plant, balancing existing process and infrastructure considerations with treatment objectives and implementation costs.

WASSTRIP Leverages PAO's Ability to Release Phosphorus

WAS from EBPR processes is rich in nutrients which are contained within Phosphorus Accumulating Organisms (PAOs). PAOs are able to release the phosphate, magnesium and potassium they absorb in order to feed on volatile fatty acids. The WASSTRIP process is designed to rapidly trigger the release mechanism of PAOs by optimizing conditions for P release. The nutrients are then diverted to Ostara's Pearl technology, protecting the digester from struvite while increasing phosphorus available for recovery.



Ostara Nutrient Recovery Technologies Inc. helps protect precious water resources by changing the way cities around the world manage nutrients in wastewater streams. The company's Pearl® and WASSTRIP® technologies sustainably transform phosphorus and nitrogen recovered from municipal and industrial water treatment facilities into a high-value, eco-friendly fertilizer, sold and marketed by Ostara as Crystal Green®. Crystal Green's unique Root-Activated™ mode-of-action minimizes phosphorus tie-up in the soil, thus enhancing crop yield and performance, and significantly reducing nutrient leaching and runoff. For more information, visit www.ostara.com and www.crystalgreen.com

