

Biological phosphorus dissolution before P precipitation from sludge liquor

Piloted by: IRSTEA and Véolia
P-source: Sludge liquor
P-product: Struvite ($\text{MgNH}_4\text{PO}_4 \cdot 6\text{H}_2\text{O}$) or "Phosphate salts" based products



The process

The process combines the bio-acidification of sludge to solubilize phosphorus with the precipitation of struvite (with Struvia™). The combination of both reactors is expected to significantly increase the P recovery yield from sewage sludge liquor (up to 75% of the total P entering in the wwtp).

The bioacidification is induced by adding easily degradable carbohydrate source in the sludge in strict anaerobic conditions. Two mechanisms are induced:

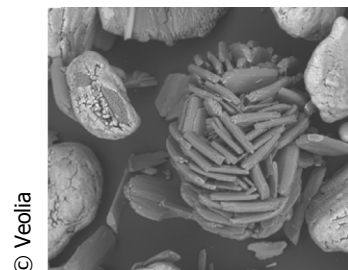
- 1) P release by the microorganisms which have accumulated the P during wastewater treatment.
- 2) Maintaining the P released by the bacteria in solution and dissolving the mineral P combined with cations by developing bacteria producing lactic acid *in situ*, decreasing the pH down to 4-5.

The product

The struvite produced can be directly used as fertilisers or as Phosphorus materials for secondary compounds.

Granular product of 200-500 µm particles size, easy to dewater by gravity up to 90%.

Product can be reused as fertiliser (direct or by blending), with low TOC (<1-2%) and metal contents.



The demonstrator

Locations: Lille / Tergnier (France)

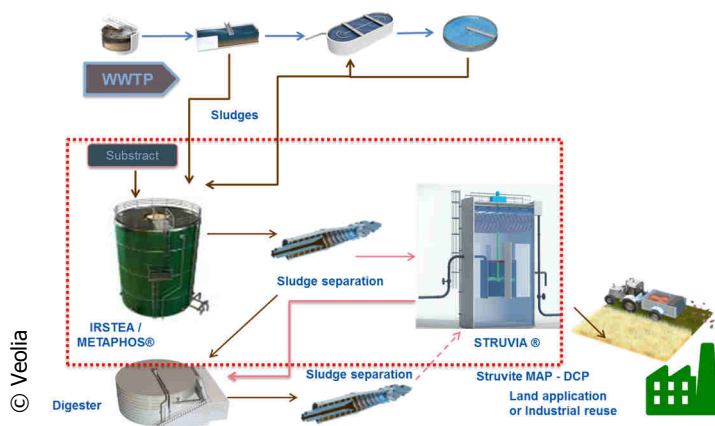
Commissioning: May 2018 / October 2019

Input material: Biological thickened sludge

Input mass: approx. 4 tons/day

Output: Struvite (MAP) or "phosphate salts" products

Output mass: approx. 9-10 kg/day as P product



Contact: Cédric Mébarki, Véolia Environnement, cedric.mebarki@veolia.com
Marie-Line Daumer, IRSTEA, marie-line.daumer@irstea.fr