Onsite Phosphorous Remobilzation for efficient P-Recycling

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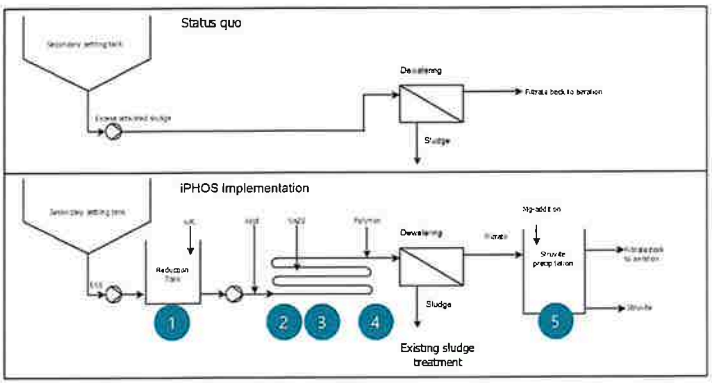
Currently, Germany is a hot spot of P-recycling activities

- Starting from the year 2029, wastewater treatment plants are required to recycle phosphorus if the phosphorus content exceeds 2% in the dried sewage sludge.
- It is expected that most of the phosphorous will be recycled in form of fertilizers or prerequisites for fertilizers.
- Experts assume that most of the sewage sludge will be treated at centralized sites.
- However, on site P-recycling is possible, if P can be remobilized from the sludge.
- We present a process for onsite P-remobilization and subsequent P precipitation as struvite, iPHOS.



The iPHOS process

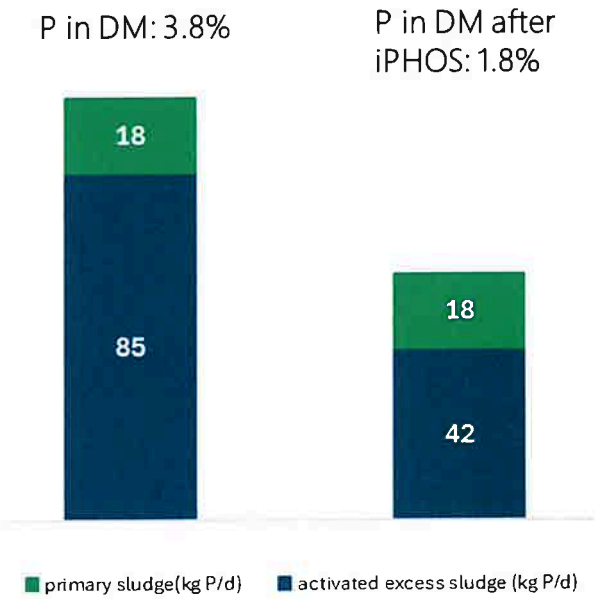
- Especially for bio-P and Fe-P sludge
- P-remobilization in activated excess sludge

The whole recycling process covers five treatment steps (see picture for implementation at WWTP).

- Step 1: The sludge is reduced by sulfur-containing reducing agents. It is the time limiting step of the process. An average residence time of 10-24 hours is optimal.
- Step 2-4: The next three steps are fast and comprise slight acidification to a pH of 4 (2), iron removal (3) and a flocculation of the sludge for subsequent sludge dewatering (4). After sludge dewatering the remobilized phosphate is in the water phase.
- Step 5: Now, it can be precipitated in the form of magnesium ammonium phosphate (struvite).

Our trials on site

- Three month test run at Gifhorn WWTP, Germany (50,000 IE)
- Sludge treatment: 5,000 IE
- Reduction of P in DM from 3.8 down to 1.8% P in DM (minimum with higher chemical dosing: 1.1% P in DM)
- P precipitated in form of struvite



The mobile plant

- Based on experiences of trials at WWTP in Gifhorn and intensive lab trials, we designed a mobile plant.
- Before the mobile plant is installed, sludge ist tested at our laboratory.
- Size: Two 40 ft Container for 5,000 – 20,000 IE
- Expected average time of operation at each WWTP: six weeks

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