Outline for one-day workshop at Aquatech, Amsterdam RAI,
Thursday 13th March 2024

https://phosphorusplatform.eu/AquatechWorkshop

The new EU requirements of the revised Urban Waste Water Treatment Directive for phosphorus removal, reuse and recycling:

interactions between tighter discharge consents, chemical P-removal coagulants, P-recovery

NOTE: participants have free access to Aquatech on condition that you MUST register BOTH for Aquatech (here) and for the ESPP workshop (here)

See: summary ESPP workshop on iron-phosphate interactions (2020) www.phosphorusplatform.eu/scope138

- **9h15 – 10h45:** Iron / aluminium salts and tighter P-removal requirements
  - Optimising coagulant (Fe/Al) use and P-removal
    - overview – *Jean-Christophe Ades, Incopa (European Inorganic Coagulants Producers Association) and Kemira, overview on coagulant use for effective and efficient phosphorus removal*
    - case studies from sewage works operators
  - Impacts on iron / aluminium concentrations in sewage sludge, discharge water
  - Impacts of iron / aluminium in sewage sludge on digester biogas energy production
  - Phosphorus removal, reuse and recycling in the revised (2024) Urban Waste Water Treatment Directive, *Dries Huygens, European Commission Joint Research Centre, phosphorus removal, reuse and recycling in the revised (2024) Urban Waste Water Treatment Directive*
  - Questions and discussion

- **10h45: Networking break**

- **11h15 – 12h45:** The revised Urban Waste Water Treatment Directive (2024) phosphorus "reuse and recycling" targets
  - **Two breakout sessions** (1 ½ h)
    - Fe/Al in digested sludge and crop phosphorus availability (P "reuse")
      Kasper Reitzel, University of Southern Denmark (SDU)
    - Impacts of Fe/al on P-recovery processes (P "recycling"): struvite precipitation, biochars, ash …
      - Christian Kabbe, EasyMining: Ash2Phos process, demonstrated separation of phosphorus from iron/aluminium in sludge ash, recovery of the P, Fe, Al
      - Mohamed Takhim, TTBS: experience on recovery of P and Fe from sewage sludge ashes containing iron by the Rubiphos process
      - Andrea Salimbeni, ReCord: investigations into separating phosphorus from Fe/Al via leaching of sewage sludge biochars
      - Hubert Halleux, Prayon: high efficiency recovery of phosphorus with iron and aluminium separation
      - Marga Breeuwsma, SusPhos B.V.: The added value of iron and aluminium for the SUSPHOS phosphate recovery technology

- **12h45 – 13h45**: Lunch

- **13h45 – 15h15:** Phosphorus recycling upstream of sludge combustion (from liquor or sludge flows)
  - **Two breakout sessions** (1 ½ h)
    - Routes to increase P-recovery rates in phosphate precipitation processes
      - Joachim Clemens, SF Soepenberg, iPhos process
      - Ostara WASSTRIP / Xylem return stream, achievable % of wwtp input P-recovery as struvite
    - Recovery of phosphorus as iron phosphate and possible uses or processing
      - Royal Haskoning DHV, Sigrid Scherrenberg, ViviMag® vivianite recovery trials –
      - Aquaminerals, valorisation routes for vivianite to products with markets
      - test results for recovery of organic phosphate esters from vivianite, SINFERT process – Kirill Nikitin, University College Dublin

- use of vivianite as an iron fertiliser

- **15h15 – 15h45:** Networking break

- **15h45 – 17h00** Conclusions, perspectives, proposals (1 ½ h):
  - Heidelberg Materials and CEMBUREAU, Michele Graffigna: Sustainability benefits of P-recovery upstream then use of P-depleted sewage sludge as fuel for cement kilns
  - Reports from the four breakouts
  - Panel with European Commission, Water Europe, water industry, other industries
  - Questions and discussions

- **17h – 17h30:** Networking drinks