



**S.C.H.O.O.N.**

**Freshwater Factory combined with  
Constructed Wetlands**

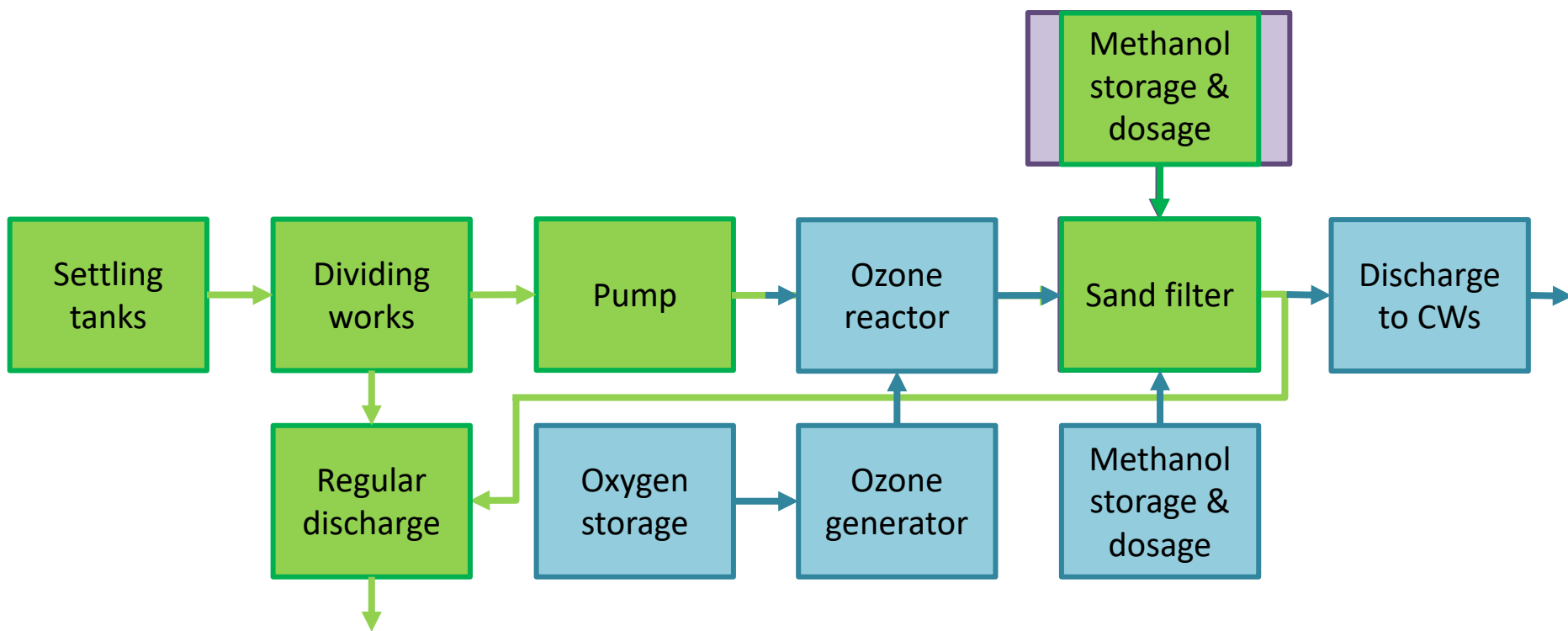
Simone van Holst, Hoogheemraadschap van  
Delfland (Water Board Delfland)



**Dutch Innovation on Micropollutants  
Removal from Municipal Wastewater  
November 7<sup>th</sup> 2019 Aquatech Amsterdam**

# Ozonation and Sand filtration

- Freshwater factory (ozone and sand filtration)
- Constructed wetland



# Ozonation and Sand filtration

- Ozone reactors
  - 2 reactors of 300 m<sup>3</sup>
  - Maximum capacity 2,600 m<sup>3</sup>/h
  - 30
  - HF
  - Op
- Sand filtration
  - Cu
  - Fil
- Construction
  - Culvert capacity max. 1,650 m<sup>3</sup>/h
  - Maximum flow to water system 30,000 m<sup>3</sup>/day



Swimming lake 

New CW's 

Pond with water plants 

CW compartments 

Existing CW's 

Influent to CW's 

WWTP

# Feasibility Study

## Emissions new discharge point

- N emission < 3.0 mg/l
- P emission < 0.3 mg/l
- Micropollutants

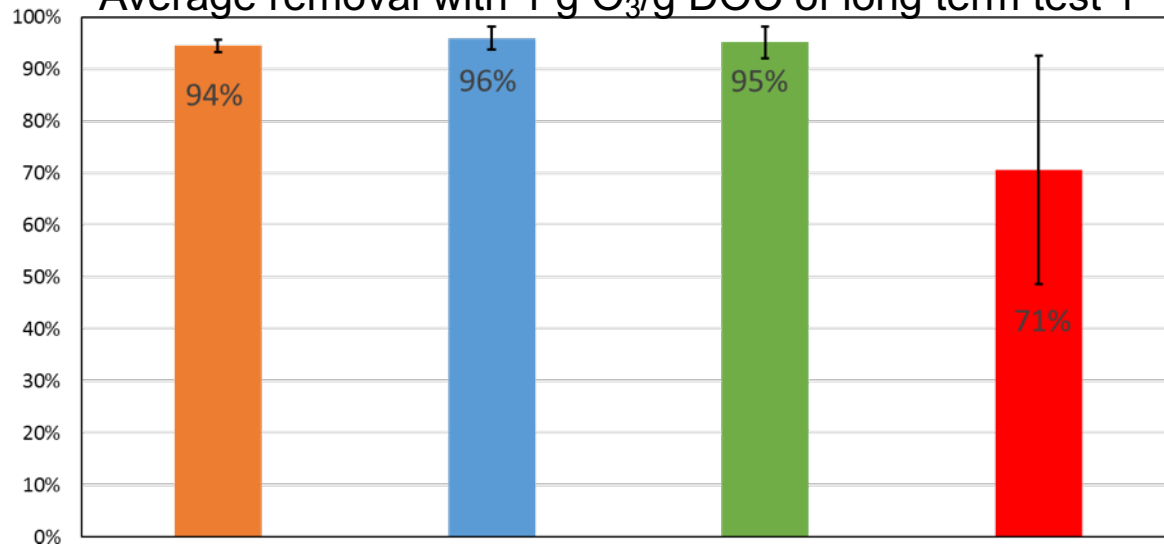
WWTP De Groote Lucht  
N=13.4 mg/l and P= 3.7 mg/l

## Dosage

- Methanol:
  - 2.5–3.0 g/gN
  - 0.9–1.2 g/gO<sub>2</sub>
- PAC or FeCl<sub>3</sub>: 2.5-4.5 mol/molP
- Ozone 0.5-1.2 gO<sub>3</sub>/gDOC

- Medicines
- Pesticides
- Corrosion inhibitors
- X-ray contrast liquids

Average removal with 1 g O<sub>3</sub>/g DOC of long term test 1



# Full scale installation

- Market consultation
- Publish Tender engineering/construction team
- Engineering/construction team result is a ready to build design
- Construct full scale installation
- Operational test phase
- Measuring and monitoring when operational
  - Meeting discharge limits
  - Water quality of receiving water body
  - Optimization process
- Participants team
  - Construction firm
  - Consultancy firm
  - Specialised companies
  - Own employees/specialists
- Integral design approach
  - Appropriate fits between components/disciplines
  - Decrease risks
    - Decrease costs
    - Decrease time needed
    - Increase quality
- Pilot research
  - Knowledge of installation
  - Preliminary design
  - Link to CW's



**Thank you for your attention!**

**Simone van Holst**  
**Hoogheemraadschap van Delfland**  
**(Water Board Delfland)**  
**[svanholst@hhdelfland.nl](mailto:svanholst@hhdelfland.nl)**



**stowa**

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