

From prediction to optimised plant operation:

Decision support for wastewater treatment



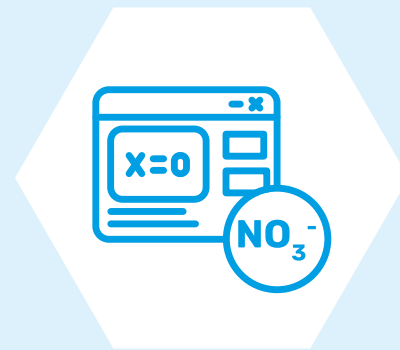
Modern wastewater treatment plants rely on complex biological processes, but many critical states cannot be measured directly in real time.

DARROW combines process knowledge with AI models to make these invisible processes visible and predictable, supporting smarter and more efficient plant operation.



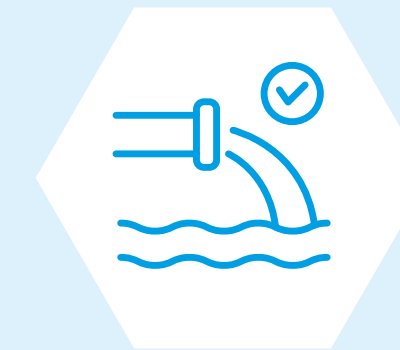
Biomass estimator

- Estimates the concentration of key microbial biomass groups in real time
- Provides insight into the plant's biological state and performance
- Uses a Long Short-Term Memory (LSTM) neural network



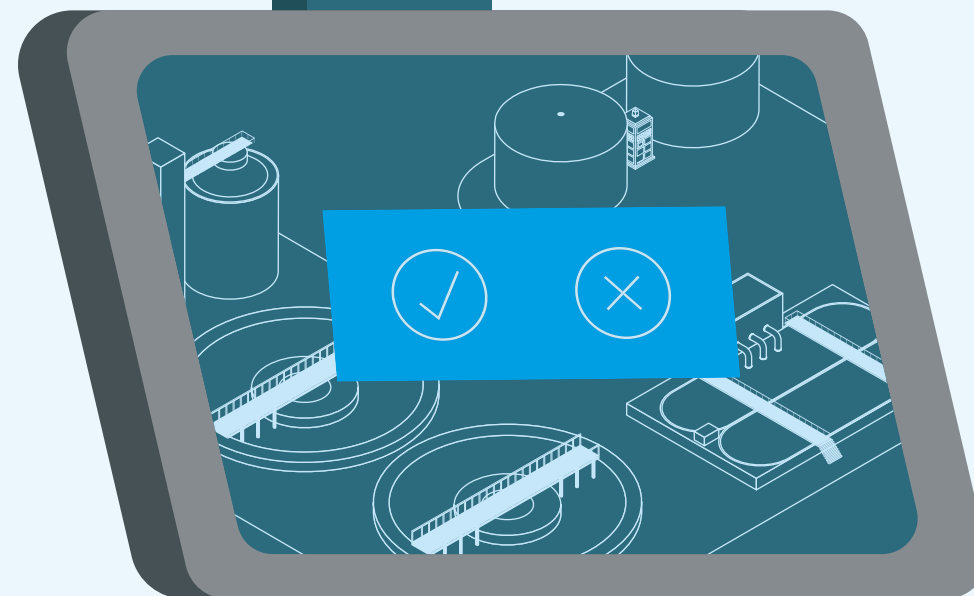
Nitrification capacity estimator

- Estimates nitrification capacity in real time
- Helps operators optimise oxygen setpoints and process stability
- Uses an Extended Kalman Filter (EKF)



Effluent forecasting and optimisation model

- Predicts effluent water quality for the next 24 hours
- Allows operators to test "what if" scenarios in advance
- Uses a Reduced Order Model (ROM) based on Long Short-Term Memory (LSTM) neural networks



What's next?

These models are ready to be deployed at the Tilburg wastewater resource recovery facility, where the DARROW platform will be tested.