

# Demonstration of ICT-based advanced process control and remote monitoring and diagnosis technology for efficient wastewater treatment plant operation

## Project Members

Consortium between Toshiba Infrastructure Systems & Solutions Corporation, Japan Sewage Works Agency, Fukuoka Prefecture and Fukuoka Sewerage Management Center

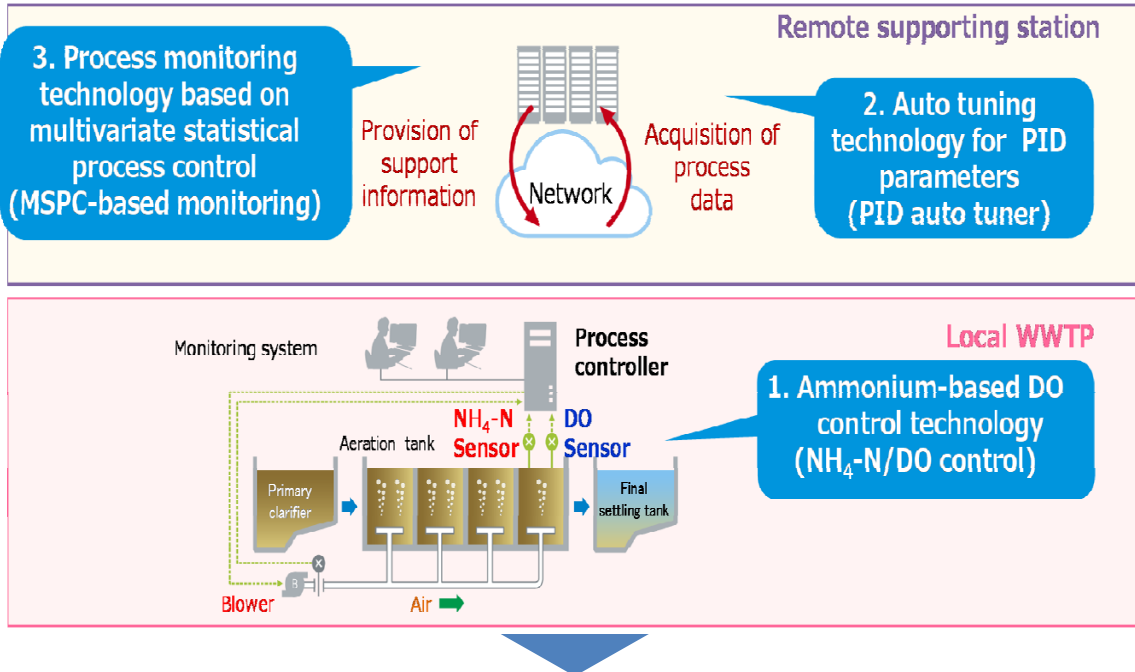
## Demonstration Field

Homangawa wastewater treatment plant in Fukuoka prefecture

## Demonstration Overview

The novel aeration control technology based on using  $\text{NH}_4\text{-N}$  sensor was evaluated in the demonstration wastewater treatment process to verify that the energy consumption (associated with aeration) was reduced while keeping the effluent quality to meet the pre-specified required effluent quality. In addition, it was demonstrated that maintainability of this control technology can be improved by introducing innovative remote operational support technology.

## Overview of the proposed technology



Realization of efficient operation and maintenance of WWTPs

## Proposed innovative technology

The proposed technology reduces operational cost by minimizing aeration while keeping effluent ammonia concentration to meet pre-specified effluent level, by integrating the following three innovative technologies.

### (1) Ammonium-based DO control technology ( $\text{NH}_4\text{-N}/\text{DO}$ control)

⇒ Optimize aeration rate while maintaining nitrification performance by controlling DO set-point according to  $\text{NH}_4\text{-N}$ .

### (2) Auto tuning technology for PID parameters (PID auto tuner)

⇒ Stabilize control performance by auto tuning of PID parameters.

### (3) Process monitoring technology based on multivariate statistical process control (MSPC-based monitoring)

⇒ Support stable operation by early fault detection and identification of relevant variables.