

Case Study

Project Title

Modular Communal WWTP Design for Scalable Multi-Site Camp Deployment

Project Snapshot

Client: PT Timah Tbk | **Location:** Batam, Indonesia

Sector: Timah Mining | **Period / status:** 2021 / Completed

Ganeca Service: Modular Design, Standardization, and Commissioning Communal WWTP

Project Overview

PT Timah operated several work camps with differing populations and wastewater flow rates, and needed a WWTP solution that could be replicated quickly without redesigning from scratch at each site. Ganeca's role was to develop a single modular Communal WWTP CSTP (Containerized Sewage Water Treatment Plant) design basis that could be scaled for flows of 15–50 m³/day while remaining easy to operate by a small team at remote locations.

The Challenge

PT Timah Tbk located in separate work areas with limited logistical access, so designing a custom WWTP for each site would have required significant engineering time and cost. In addition, on-site operational staff were generally limited in number and did not always have a technical wastewater-treatment background, so the system needed to be easy to monitor and operate without complex instrumentation.

Our Solution

Ganeca developed a modular design framework for its CSTP (Containerized Sewage Treatment Plant) based on a process flow moving from a collection tank directly to extended aeration, sedimentation, and UV treatment; regarding sludge management, a portion is diverted to filter bags while the rest is recirculated to the aeration stage, allowing the team to simply adjust tank dimensions according to each camp's flow rate without redesigning the core process. Anaerobic tank modules are standardized into two suitable for various locations with similar flow scales, thereby accelerating procurement and construction compared to fabricating custom sizes for every site. To facilitate monitoring by a limited workforce, the system is equipped with check valves and flow meters on both inlet and outlet lines, with data centralized in the operator room, enabling flow conditions to be monitored without requiring manual inspections of individual tanks. This modular approach streamlines the design-to-installation process for new camp sites by allowing the team to simply recalculate flow rates and select the most appropriate tank modules, rather than designing a system from scratch.

Results & Value

The modular approach significantly accelerated deployment, reduced engineering effort, and improved system scalability. By combining flexible, pre-engineered modules, the system can be tailored to each camp's flow requirements and replicated across multiple sites without starting the design process from

scratch. This results in faster implementation, greater cost efficiency, consistent system quality, and easier future expansion enabling a proven solution to scale efficiently across different operational conditions.

Project Photos



Layanan terkait: [Water and Wastewater Treatment Solutions](#)