

Customer: Company in the field of maintenance services for rolling stock with existing in-house sewage treatment plant in southern Germany.

Year: 2011-2012



Retrofitting of blending and buffer tank

Application:

The existing part of the wastewater cleaning plant was done (previously) with the activated sludge procedure (aeration tank) with secondary sedimentation chamber. The biology is nurtured by adding substantial volumes of external carbon sources as substrate substitute. The super-dimensioned reactor volume (approx. 600 m³) causes significant operational costs and problems during winter operation. The existing aeration tank is an enameled steel tank positioned above ground. The tank is displaying growing corrosion damage and other technical wear signs. Structure and technology have an urgent restoration and replacement requirement.



rugged (shake) control unit

The wastewaters from washing processes which are produced hydraulically irregularly (20-100m³/d), may contain high carbon concentrations (up to 10.000mg/l), compounds which are hard to decompose (industrial cleaner) and a deficit of nutrients (N,P-deficits). Due to the commercial part of the wastewater, it is hard to estimate in advance which substances will flow into the sewage treatment plant. Therefore, the biological stage must be rugged and possess a high self-regulatory potential. The plant must be fully automatic with a simple to operate, rugged control unit.

Used technology for wastewater cleaning

Blending the blending and buffer tank, filling device; filling control according to fill level, biological stage, sedimenting device with subsequent removal of the secondary sludge.

Process flow of the sewage treatment plant



Internal view machine container

The wastewater is already pre-cleaned mechanically through filtering by the customer, the pH value is set close to 7. Afterwards, it reaches a buffer tank, which was reconditioned as M&A with big bubble aeration. Pre-decomposition can be controlled here, the sludge must be removed. The biology is filled via a level sensor, depending on the water level and integrating via a time function. In an subsequent lamella separator, the secondary sludge is removed from the clear water. The core component is the container based fixed-bed biology. The submersed ventilated fixed-bed is more durable than the activation process because organisms with longer generation times (specialists for just this substrate degradation) can be colonised more easily due to the fixed sedentary medium.



Lamella clarifier

The age of the sludge concerning the biomass retention is of lesser importance. The wastewater production fluctuates and depends on the production of rinsing water. Therefore, the bioreactor is divided into cascades, designed as fully blended stirring vessel, where the wastewater flows through in sequence. On the one hand, this leads to a very high cleaning capacity, and on the other hand, the plant is more resistant to underload/ overload.

What are the benefits for the customer?

Improving operational security, state-of-the-art, decreasing operational costs, quick construction time, high quality and pre-assembly.

Service of the PPU GmbH:

Approval planning Installation, assembly and commissioning of the plant.

In this case, an industrial sewage treatment plant was restored with adaption to the actual load and considering the state of the art.

CFC-FB 100 Container – cascaded fixed-bed biology

CFC-LA 5 Container – Lamella clarifier