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Biological Wastewater Treatment

Rudolstadt-Schwarza, Industrial Park

Wastewater Treatment Plant

BAMAG received an order for turnkey expansion and upgrading of the existing ABA I wastewater treatment plant for the Schwarza Industrial Park in Rudolstadt, Germany. Value of the contract came to about € 7.1 million.

Flows treated in the existing, converted and new sections of the wastewater treatment facility include effluent from a papermaking plant and the park's industrial and sanitary wastewaters.

Major systems of the facility are an anaerobic treatment stage with gas desulfurisation system, the converted and new aerobic treatment stages, and final clarification systems integrating a calcium carbonate sludge separation unit.

Bamag is an international EPC contractor for water and wastewater treatment plants as well as thermal processes.
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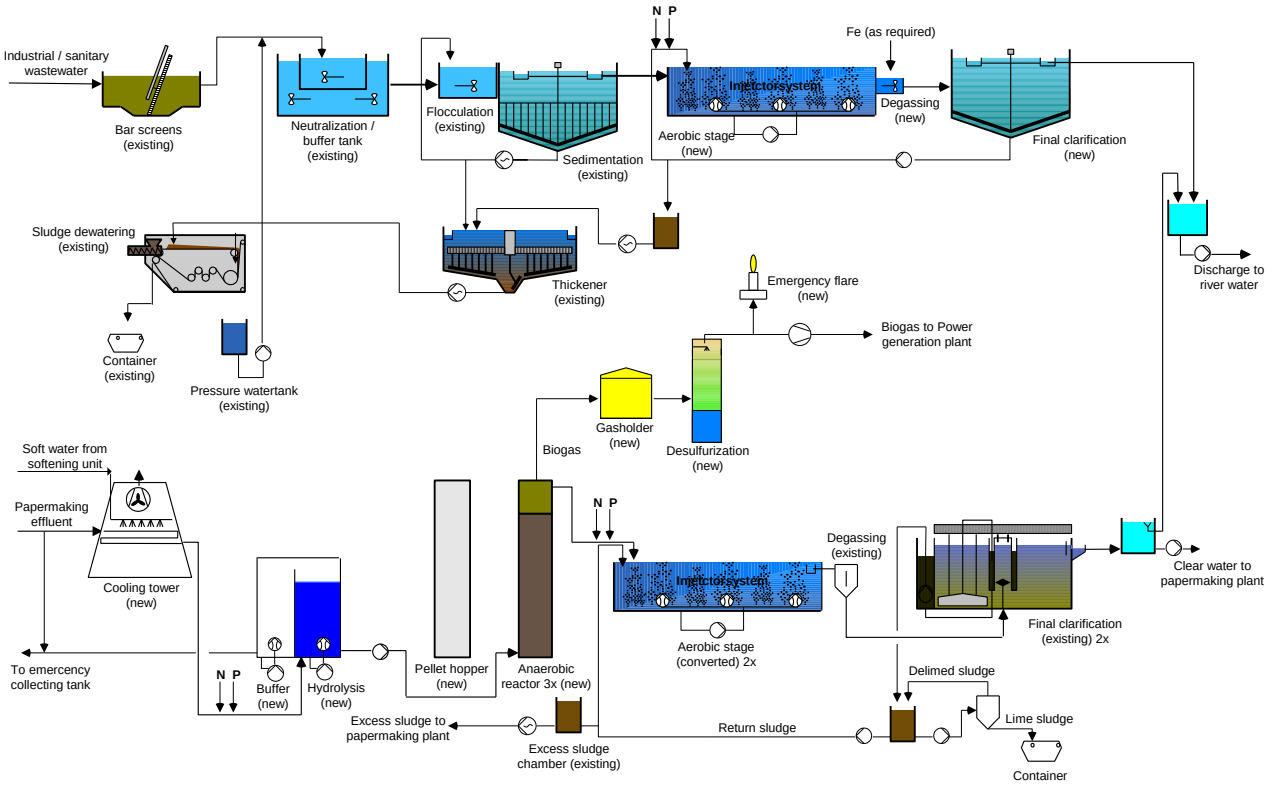
... the experts

Bamag
6. El Terra St. Hadayek El Ahram - Giza, Egypt
Tel . +2 (02) 3377 2082 Fax. +2 (02) 3376 2465
www.bamagllc.com



1. Objective

Expansion and upgrading of the Rudolstadt industrial park facility as a biological anaerobic/aerobic wastewater treatment plant for separate treatment of effluent from a new papermaking plant and combined flows of industrial and sanitary wastewaters.

Design data:

Papermaking effluent

Flow	7,416 m³/d
COD	40,000 kg/d
BOD	20,000 kg/d

Industrial and sanitary waste waters

Flow1,084	m³/d
COD1,473	kg/d
BOD	735 kg/d

Treatment target
Direct discharge into river

2. Plant concept

Production effluent from papermaking plant:

Primary treatment
- Cooling

Biological pretreatment
- Anaerobic treatment stage

Final biological treatment
- Converted aeration stage (existing)
- Final clarification tank (existing)

Biogas treatment
- Gasholder
- Desulfurisation

Industrial park waste waters:

Mechanical pretreatment
- Bar screening (existing)
- Neutralisation (existing)
- Flocculation (existing)
- Sedimentation (existing)

Biological treatment
- Aerobic treatment stage
- Final clarification tank

Sludge treatment
- $CaCO_3$ separation system
- Thickener (existing)

Operating building / Chemical store (part existing)

Production effluent from the papermaking plant is routed via the cooling system to the anaerobic treatment stage and supplied with nutrients.

The anaerobic treatment stage is designed to economically reduce COD while producing biogas. Anaerobic pre-treatment is carried out in three reactors using biomass pellets. Separation of the gas-water-pellet mixture takes place in an integral separation system. The biogas produced is biologically desulfurised and supplied to the owner for utilisation. Final biological treatment of the wastewater is carried out in the existing converted aeration stages and final clarification tanks (two streams) to obtain quality of effluent suitable for direct discharge to the receiving water.

Separate treatment is provided for the combined industrial and sanitary wastewater flows from the industrial park. Following mechanical pretreatment (existing system), final biological treatment of the wastewater takes place in the new aeration stage and final clarification stage with supply of nutrients as required.

The two final treatment effluents are combined and discharged to the receiving water. Provision is made for separate return flow of treated papermaking effluent to the papermaking plant whenever required. The papermaking effluent tends to heavy precipitation of calcium carbonate, requiring use of an appropriate aeration system and installation of a calcium carbonate separation system for stabilisation of the activated sludge process. Excess sludge from the papermaking effluent is sent to the papermaking plant and that from the industrial and sanitary wastewater flows is routed to the existing thickener. The separated calcium carbonate sludge is collected for direct disposal.

The water can be stored temporarily in an existing emergency collection tank in the occurrence of any unforeseen operating state.

3. Features

- High process stability due to designed-in flexibility
- High reliability of operation due to redundancy and reserve capacity included in treatment process
- Significant reduction of sludge volume due to anaerobic pretreatment
- Integration of existing plant
- Small space requirement
- Short time for completion

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