

# Biological Wastewater Treatment


Izmit, Turkey

Industrial  
Wastewater



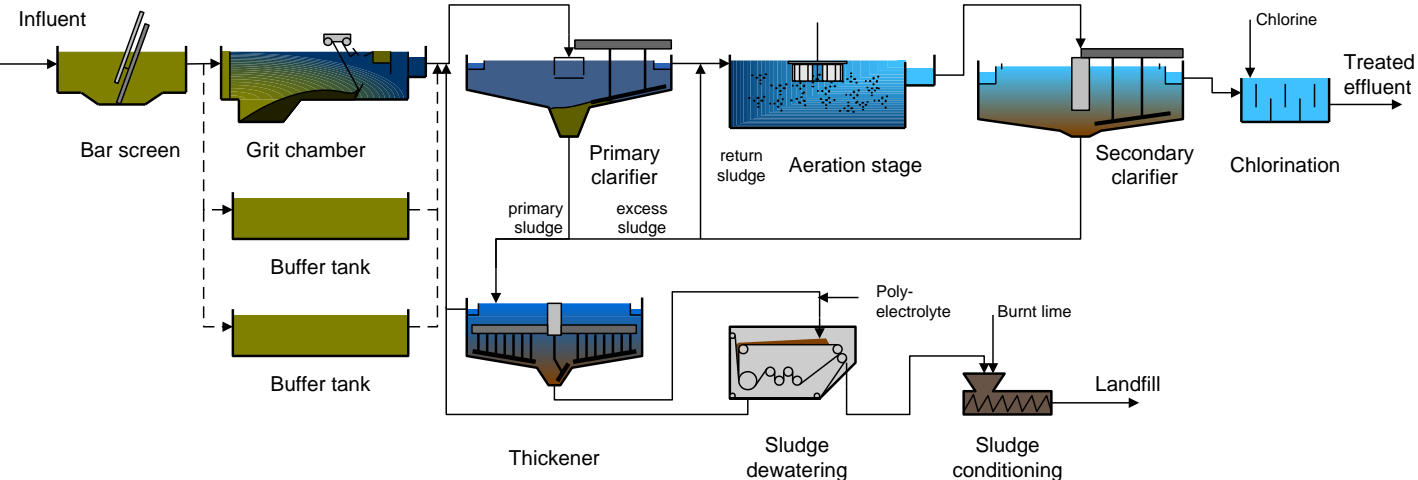
Since the construction of the wastewater treatment, Izmit Bay was the dump of a great variety of untreated effluent streams from diverse origins.

A separate sewer system and a biological wastewater treatment plant serving 25 factories in the municipality of Izmit have put an end to this unacceptable situation. The wastewater treatment plant biodegrades the organic pollutant load so that the treated water can be released to the Mediterranean Sea without posing a water pollution hazard.



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**1. Objective**

Treatment of industrial and municipal wastewater

- Design data
  - Throughput 35,000 m<sup>3</sup>/d
  - BOD5 load 9,000 kg/d
  - COD load 28,800 kg/d
  - Suspended solids 12,600 kg/d
- Treatment criteria
  - BOD5 ≤ 45 mg/l
  - COD ≤ 100 mg/l
  - Suspended solids ≤ 30 mg/l
  - pH 6 - 9

**2. Plant concept**

- Process steps
 

Mechanical pre-treatment, buffering, primary sedimentation, biological treatment, secondary clarification, disinfection, sludge thickening and dewatering.
- Brief description
 

The waste water is routed through the bar screen and grit chamber directly to the primary clarifier. During wet weather, the excess flow is directed to buffer tanks. In the primary clarifier, the primary sludge is settled before the pretreated water is pumped to the biological treatment stage. Biodegradation of the organic pollutant load is accomplished in the aeration tank. The resulting waste activated sludge is settled in circular secondary clarifiers and directed to the sludge treatment unit.

In a final treatment step, the clarified waste water is disinfected before being discharged to the sea.

The primary sludge and the waste activated sludge from biological treatment are united, subjected to mechanical thickening and subsequent dewatering before being routed to land disposal.

**3. Characteristic plant data**

- 2 bar screens
  - Bar spacing 10 mm
- 1 dual-compartment grit chamber
  - Clarification area 40 m<sup>2</sup>
- 2 buffer tanks
  - Volume 5,000 m<sup>3</sup>
  - Depth of water 5 m
- 2 primary clarifiers
  - Ø 20 m
  - Clarification area 314 m<sup>2</sup>
- 2 rectangular aeration tanks
  - Volume 10,370 m<sup>3</sup>/tank
  - Solids content 4 kg DS/m<sup>3</sup>
  - Gyrox surface aerators
- 4 secondary clarifiers
  - Ø 25 m
  - Clarification area 490 m<sup>2</sup>/tank
  - Depth of water 3 m
  - Scraper
- Disinfection unit
- Sludge treatment
  - 1 thickener Ø 14 m
  - 3 belt filter presses with integrated thickener drum
  - Sludge conditioning with CaO

**4. Operating experience**

reached after only a short running-in and acclimation period. The plant consistently meets the guaranteed effluent discharge criteria at 100 % load.