Plant Portrait

Biological Wastewater Treatment

MALATYA / Turkey

Municipal and Industrial Waste Water Treatment

At the central sewage treatment plant of the City of Malatya (Turkey) sanitary and industrial wastewater is treated by means of mechanical and biological methods to meet European Standards. The treated effluent passes to the river and the generated sludge will be used in agriculture or can be dumped after mechanical dewatering.
The plant is designed for a capacity of 720,000 PE (population equivalent), which corresponds to a daily waste water flow of 133,600 m³/d.

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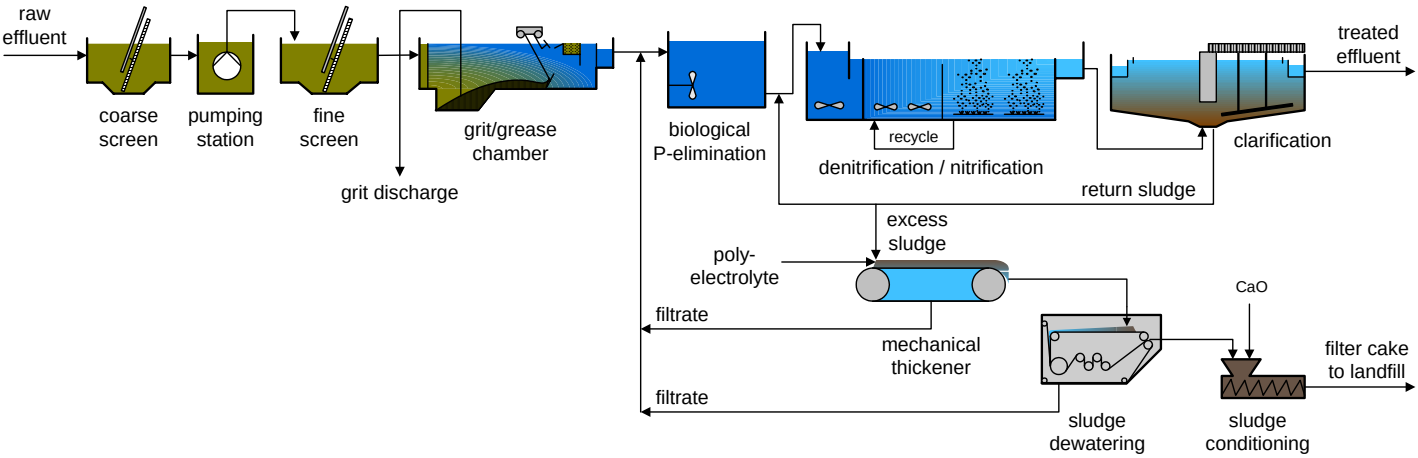

1. Objective

Treatment of sanitary and industrial wastewater

Freights at plant inlet

Daily flow	133,600 m³/d
BOD_5	32,400 kg/d
COD	64,800 kg/d
Suspended solids	37,800 kg/d
Nitrogen, total	5,940 kg/d
Phosphorus, total	970 kg/d

Treated water quality

BOD_5	25 mg/l
COD	125 mg/l
Suspended solids	35 mg/l
Nitrogen, total	10 mg/l
pH value	6 - 9

2. Plant concept

Treatment stages

Wastewater pumping station and mechanical pre-treatment with coarse and fine screen, aerated grit and grease chamber.

Biological treatment with selector, anaerobic and aeration tanks, sedimentation and sludge pumping station.

Sludge treatment with mechanical thickening, dewatering and conditioning.

Brief description

Wastewater at plant inlet is first lifted by pumps up to a level that it can pass through from the pump discharge to the recipient by gravity.

After pre-treatment by screens and grit/grease chambers waste water is treated biologically. Biological treatment consists of a selector as first stage in which return sludge is added, an anaerobic tank for phosphorus removal, and the aeration tanks with oxic and anoxic zones for the degradation of organic carbon (BOD_5 and COD) as well as Nitrogen by means of nitrification and denitrification. Activated sludge is separated in the upstream clarifiers and routed back to the selector from the return sludge pumping station.

Excess sludge will be mechanically thickened and dewatered by belt filter presses. For the improvement of sludge thickening polyelectrolyte is dosed as floc aid. The discharged filter cake will be disposed off from the plant and used for agriculture purposes or will be dumped after final conditioning with quick lime up to a content of dry solids of 35%. For this the associated equipment like sludge / lime mixer, quick lime silo with dosing is provided.

3. Characteristic plant data

Inlet pumping station

2 Pumps A
Capacity 6,000 m³/h

4 Pumps B
Capacity 3,000 m³/h

Mechanical pre-treatment

3 Fine screens
Bare spacing 6 mm

2 Screenings presses
Capacity 4 m³/h

4 Grit chambers
Type:
Longitudinal, aerated grit chamber
Length 60.00 m
Width 3.50 m
Grease chambers integrated
Width 2.10 m

2 Grit/grease scrapers
Type: Double bridge blade scraper
Span 9.50 m

4 Grit pumps
4 Grease pumps

2 Grit classifiers
Capacity 40 m³/h

Biological treatment

1 Anaerobic tank
Volume 18,230 m³

8 Submersible mixers

6 Aeration tanks
Volume, each 28,330 m³

4 Submersible mixers each tank

1 Circulation pump each tank
Capacity 3,750 m³/h

Fine bubble aeration

4 Turbo-blowers
Capacity 14,000 m³/h

6 Clarifiers
Diameter 55.00 m
Water depth 4.70 m

6 Scrapers
Type: Blade scraper

4 Sludge pumps
Capacity 4,500 m³/h

Sludge treatment

3 Feed pumps
Capacity 80 m³/h

3 Belt thickener
Capacity 80 m³/h

1 Floc aid dosing
Concentration 0.5 / 0.1 %

3 Belt filter presses
Capacity 12 m³/h

1 Quick lime silo with lime feeder

1 Sludge/lime mixer
Capacity 12 m³/h

4. Remark

Due to the fact that the aeration is operated as simultaneous sludge stabilisation for the first stage of extension, primary sedimentation as well as anaerobic sludge digestion is not considered necessary for the time being. These treatment stages will be provided for the second extension.