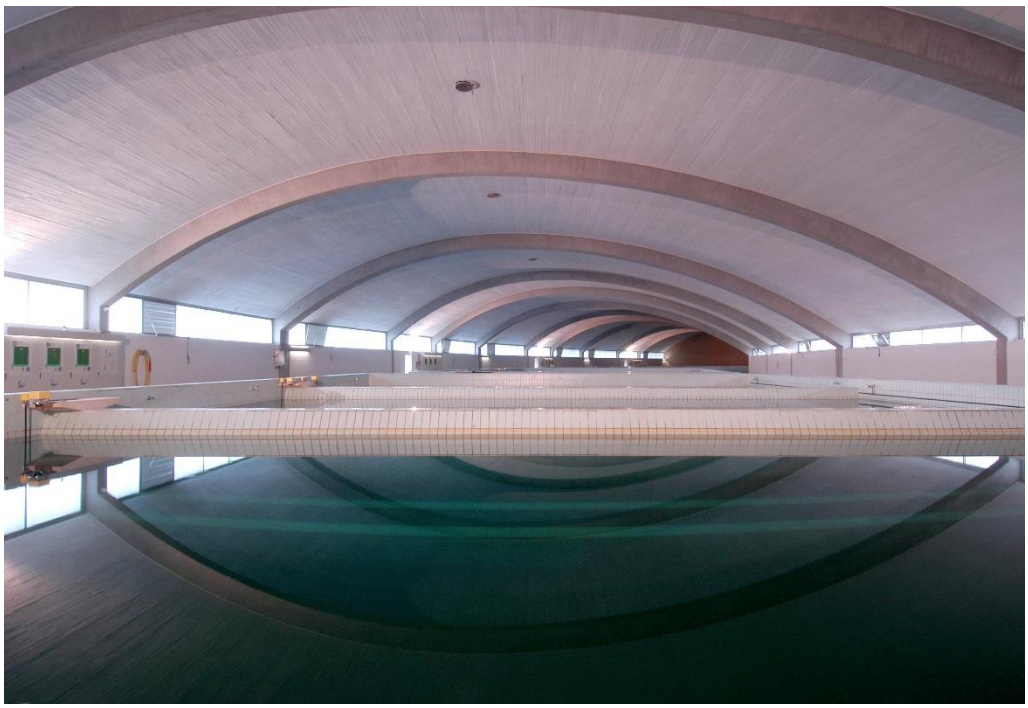
Potable Water Treatment Plant

Sipplinger Berg / Germany



To improve the supply with potable water in some parts of southern Germany, the „Zweckverband Bodensee-Wasserversorgung“ erected a 600 000 m³/d drinking water treatment plant.
Its one of the first of its kind in Germany that uses surface water for the production of potable water.

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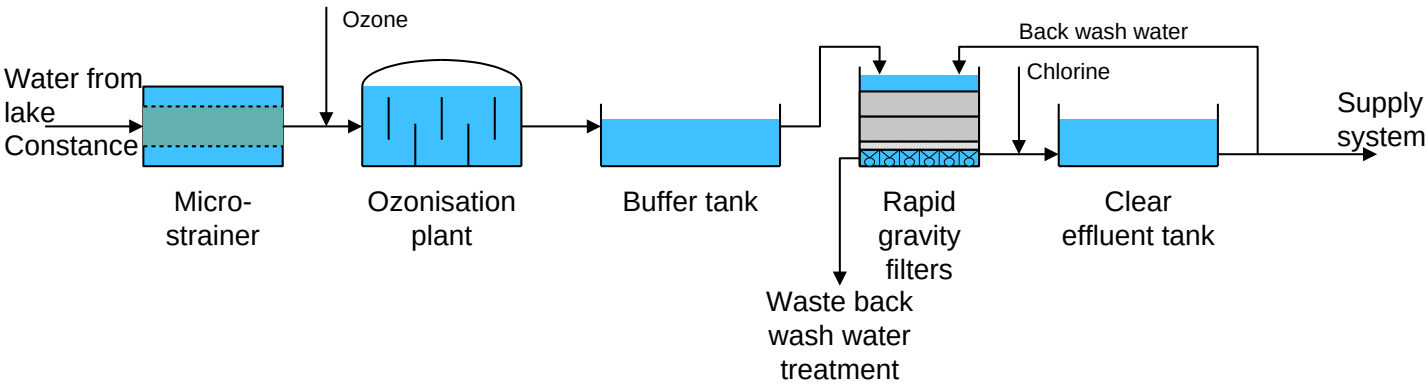

1. Objective

-Treatment of potable water

- Design data
- Source: Lake Constance

Throughput	600,000 m³/d
Max. throughput	675,000 m³/d
Turbidity	5 NTU
Total bacteria	5,000
Colour	0.3 SAK 436/m
pH	7.9

- Treated water quality

Turbidity	< 0.1 NTU
Total bacteria	0
Colour	< 0.005 SAK 436/m
pH	7.95

2. Plant concept

- Process steps

  Micro-strainer, ozonation, filtration through rapid gravity filters, chlorination, backwash water and sludge treatment

- Brief description

  The raw water intake is at 60 m depth in middle of lake Constance. From there the water is pumped through 2 pipelines to the treatment plant and discharged into a raw water distribution chamber and then routed to 12 micro-strainers.

  The micro-strainers are equipped with filter cloth of 40 µm mesh size which remove most of the micro-particles, e.g. plankton from the lake.

  The water is ejected through nozzles into high pressure ozonation chambers to prevent algae growth and provide disinfection.

After the disinfection step, two large storage tanks equalize the water flow to the filtration unit.

Filtration is accomplished in dual-media, rapid-gravity filters which operate in the downflow mode and are equipped with nozzleless M-block filter bottoms.

27 filters are arranged in the filtration building of 320 m length.

The filters are of the single bed type. Water from the clarified water channel is led into each filter via an adjustable overflow weir which ensures uniform distribution of clarified water to all filters irrespective of fluctuations in the flow rate.

As solids build up in the filter bed during the filter run, the differential pressure across the filter bed rises, thereby compensating the head loss. When the differential pressure has reached a pre-set maximum level, filter backwashing is initiated. Filter backwashing serves the dual purpose of cleaning the filter bed of accumulated solids and loosening up the bed. Filter backdating in water treatment applications typically comprises the following steps: air scouring - combined water wash and air scouring - water wash.

At the outlet of the filtration unit, chlorine is added to the filtered water to provide final disinfection.

From the treated water tank, the water is pumped to the supply system.

The treated back wash water is discharged into a small river.

3. Characteristiv plant data

- 12 micro-strainers

Ø	3.1 m
mesh size	40 µm

- ozonation plant

  6 ozonation chambers

  32 kg ozone/h

- 2 buffer tanks

volume	70,000 m³

- 27 rapid gravity filters

  open submerged dual-media filters

filter area	111 m²/filter
fitration velocity	6 m/h
	max. 9 m/h

- chlorination unit

  for filtered water chlorination

- 1 treated water tank

volume	38,000 m³/tank

- back wash water treatment