

Tunnel Water Treatment Plant whilst Construction of the Gotthard Base Tunnel in Amsteg, Switzerland



BAUERUmweltgruppe

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| Client: | AlpTransit Gotthard AG (ATG), Switzerland |
| Engineering Design and Supervision: | Ingenieurgesellschaft Gotthard-Basistunnel Nord |
| Scope of Works: | Creation and Operation of a Water Treatment Plant for Waste Waters from Tunnel Construction Works |
| Contract Period: | May 2002 to 2010 |



Project

The construction of two 57 km long tunnel tubes of the Gotthard base tunnel required a water treatment plant for the intermediate section Amsteg. In co-operation with GEBR. BRUN AG, Construction Company Luzern, Switzerland BAUER und MOURIK Umwelttechnik operates the treatment plant for "Los 208, Water Treatment Amsteg" with various capacities. It is possible to run several plant units in simultaneous mode and to enlarge the plant if necessary.



CO₂-tank and process water container for the neutralisation of the treated water.

Treatment Site

The accumulating mountain water will sequentially change in the course of the planned eight-year long construction period for the tunnel. This requires a plant construction with high flexibility. The major parameters for the plant construction are:

- Water volume
- Sludge volume
- Acid demand for neutralisation
- Cooling System
- Plant units

Result

The tunnel water treatment plant is operated since March 2003. The plant is operated with a free potential gradient without any pumps or lifting procedures. The flow rate control is adjusted by mechanical weirs and slidegate valves. The water runs through two treatment units with an overall capacity of 860 m³/h in the following process steps:

- In the distribution building the tunnel water is collected and distributed to the two treatment units. In case of increased water amounts the water is led into two retention basins with a volume of 1,800 m³ each by an automatic overflow.
- In the oil separator the separation of light oil phase and water phase is reached through an elutriator.
- Solid and liquid flocculation agent is added in the contact basin, dependent on the flow rate and the turbidity.
- In the sedimentation basin the flocculated solids are removed. Circular scrapers push it into a sludge funnel. A sewage press drains the sludge. The filter cake is disposed off and the filtrate is led back into the water treatment plant.
- Neutralisation is gained via addition of carbonic acid.
- By the addition of an oxidising agent nitrite resulting from the breakups in the tunnel is eliminated.

- Sprinkle towers cool the tunnel water in case of increased temperatures and in case of a low water level in the receiving stream.
- A continuous on-line recording of all data, notifications of emergency by text message and a remote control allow a continuous monitoring of the plant.



Sprinkling towers with special muffler in the standby mode.



Treatment unit with circular scrapers for removing solids.