

BLĀZMA

Constructed wetlands for wastewater treatment

Type of pilot measure:

Constructed wetlands

Location:

Blāzma, Latvia

Site:

Blāzma Wastewater Treatment Plant

Applied solution:

Combined system of vertical and horizontal subsurface-flow constructed wetlands

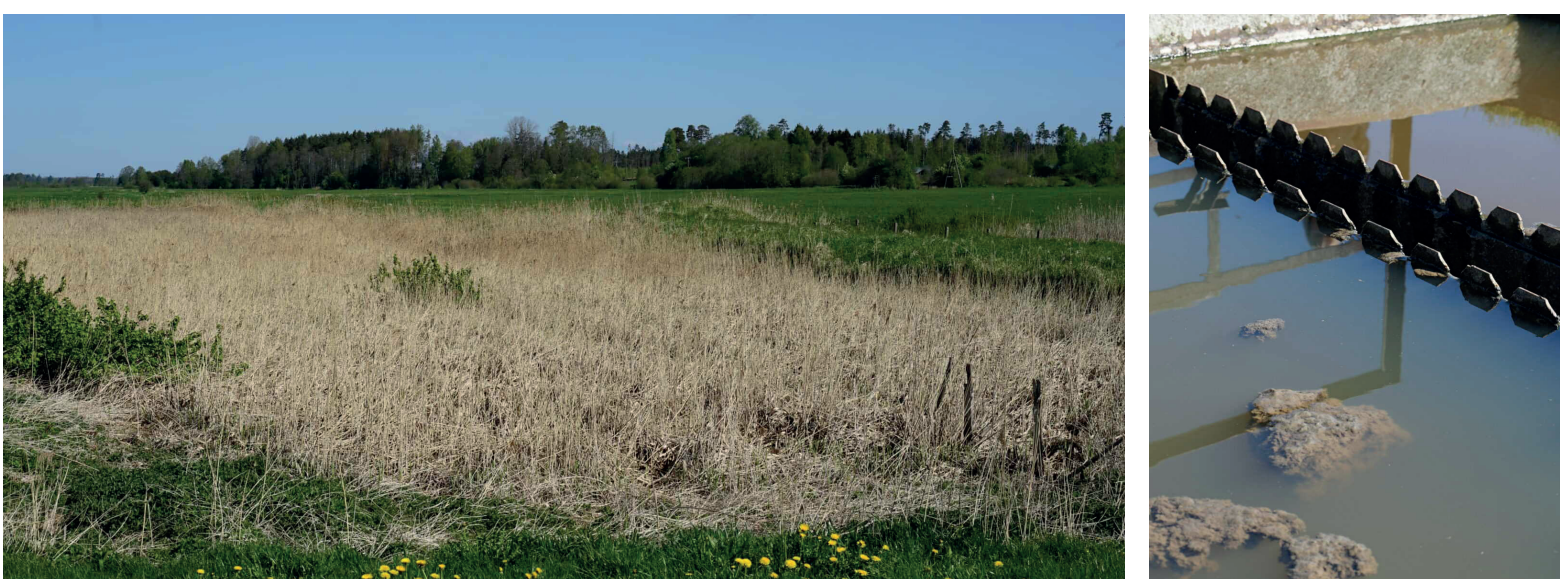
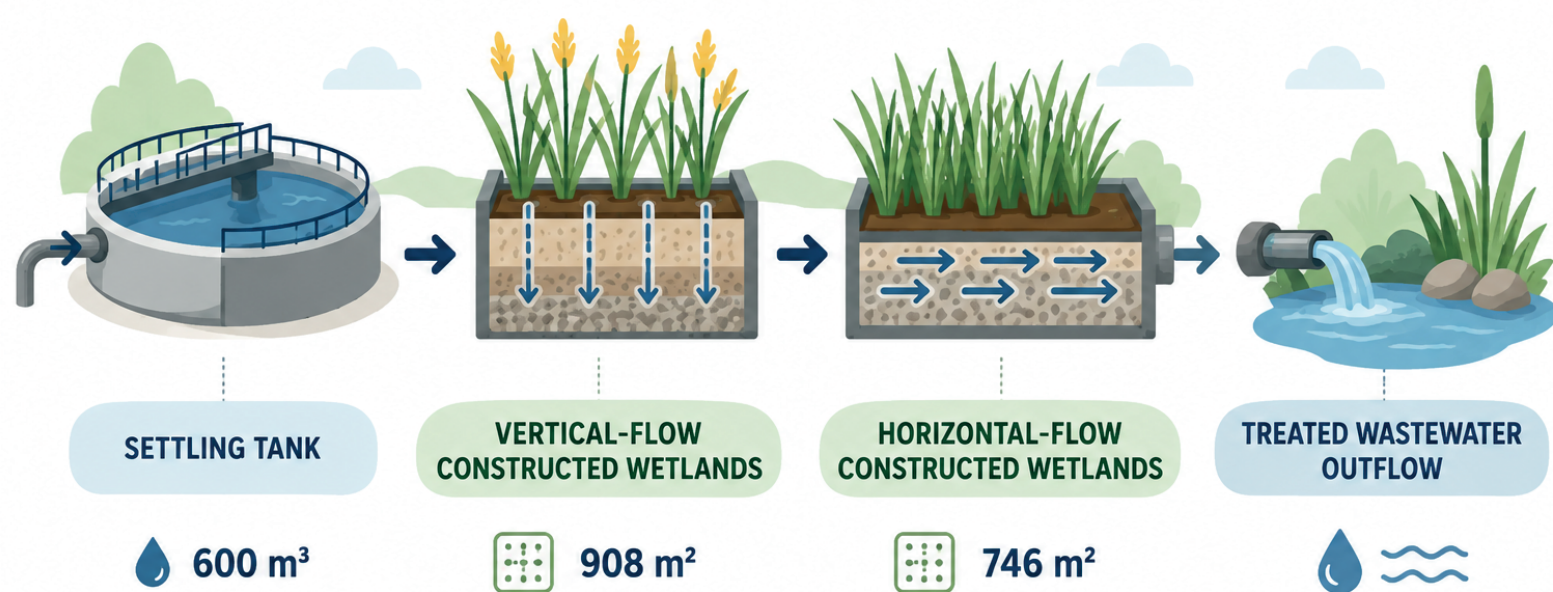
Designed treatment capacity:

250 m³/day on average

Utilisation:

Domestic wastewater treatment

Responsible: VNK Serviss



The wastewater treatment plant in Blāzma is one of the oldest small biological wastewater treatment plants in the Ventspils region and has not undergone significant improvements since its construction. It treats only domestic wastewater, but the volume and pollution load vary throughout the year. During the active tourist season, pollution loads can fluctuate significantly, while the infiltration of rainwater and groundwater into the centralised wastewater collection system can cause periodic hydraulic overloads.

In the past, biological ponds were used in Blāzma as a post-treatment method, but their use was later discontinued. In their place, a constructed wetland system combining vertical and horizontal subsurface flow has been designed to handle hydraulic and pollution peaks during periods of increased wastewater loads. The designed system has an average treatment capacity of 250 m³/day. After pre-treatment in a sedimentation basin, wastewater passes through two parallel vertical-flow constructed wetlands, followed by two parallel horizontal-flow constructed wetlands.

The vertical-flow stage provides better aeration conditions, supporting the removal of organic matter and nitrification, while the horizontal-flow stage creates anoxic conditions for final denitrification and nitrate-nitrogen removal. The system has also been adapted to Latvia's climatic conditions. Because air temperatures fall below 0°C seasonally, both wetland stages are designed with subsurface flow, and the infiltration pipes are covered with soil to reduce the risk of freezing. The wetland surface will be planted with common reed.



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