Municipalities are obliged to ensure that wastewater treatment plants operate under service conditions and discharge the purified waste water continuously into the on-site pre-flooder. Generally, conventional sewer systems operate without problems in normal conditions. However, during periods of heavy and persistent rainfall, large water volumes are carried along with wastewater to an extent that the sewage purification plants (SPP) can no longer cope with. In this case, the SPPs have to “open the sluices”: the wastewater is discharged untreated – although considerably diluted – into the waters. To solve this problem, retention tanks have previously been built which have stored the accruing water volumes until a controlled discharge into the sewage plants can be effected. However, such retention tanks are very costly and also difficult to realise – particularly in residential areas - given the large land requirement. During the years leading up to the project, the weather conditions became more extreme with heavy rainfalls even in temperate zones. A buffer system is therefore needed as set out under the EU-Directive 91/271/EEC. The HydrOstyX ® system provides a possible solution as it allows the use of the spare capacity available within the sewage network itself as storage volume.
The project aimed to use the capacity of sewer systems to develop internal retention ponds to store precipitation water during heavy rainfall. The installation of discharge brakes in the sewer systems would enable the management of this feature. This work sought to avoid the costs of installing intensive storage basins and to ensure a continuous and manageable discharge after heavy rainfall to the wastewater treatment plant. The project intended to establish a formal structure made up of two German towns, Stuttgart and Stockach, two Austrian towns, Götzis and Feldkirch, and the German sewage association AZV Lamer Winkel to demonstrate the functioning of the procedure in different conditions.

Results

Despite significant delays in implementation - due to complications in signing cooperation agreement contracts - the project succeeded in installing all the buffer systems for the management of wastewater during heavy rainfall. The technology proved itself to be simple and effective and should have a high transferability to other countries, which suffer the same risks. In Feldkirch, the HydrOstyx ® procedure made it possible to exploit the volume available in its network of sewer channels for the adequate retention of water. It installed a specific arrangement of storage cascades in the main collector with five discharge brakes to retard the water in the sewage network as long as necessary. At a cost of EUR 900,000, this equipment results in a saving of EUR 1,500,000 compared to the costs associated with rain basins for mixed water treatment. In the municipality of Götzis, the previously unused volume of the Lastenstrasse main collector - 1,810 m³ - was activated by creating a storage cascade with a rigid discharge brake and a second storage cascade using oscillating brake technology. This made it possible to avoid further construction for mixed water treatment purposes in the affected area with savings of EUR 1,725,000 or 80% of projected costs. A total of 31 storage cascades were installed into the main collector leading into the sewage treatment plant of AZV LAMER Winkel. This activated a calculated volume of 1,250 m³ for mixed water treatment purposes, saving EUR 601,000, corresponding to 49 percent. The town of Stockach activated the collector volume in the Industriestrasse trough the creation of storage cascades. This made it possible to do without an extension of the RÜB Kniebreche and therefore for cost savings amounting to 72 percent or EUR 553,000. The combined water treatment in Bad Wörishofen is carried out alongside the available storm water tank by the innovative formation of storage cascades. By certified proof and hydrodynamic long-term simulation calculations, an optimal water economy solution can be achieved with perfect control over water discharge and overflow.

Themes
Water - Waste water treatment

Keywords

urban wastewater, waste water treatment, rain water

Target EU Legislation

- Water

Natura 2000 sites

Not applicable

Beneficiaries:

Coordinator: GdBR / Europäische Kommunale Interessengemeinschaft (EKI)
Type of organisation: Mixt enterprise
Description: EKI (Europäische Kommunale Interessengemeinschaft) is a German civil law association whose name means European Municipal Joint Venture of Interests which was founded only for the LIFE project and consists of three municipalities and one engineer consultant Güthler Ingenieure, who manages the project.

Partners: Stadt Feldkirch, Austria Marktgemeinde Goetzis, Austria

Administrative data:

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