The history of the Gümmerwald Sewage Works

In the 1960s, the Leine around Hannover was one of the dirtiest rivers in Lower Saxony. The water quality of the smaller streams in and around Hannover also left much to be desired. One reason for this situation was that the cities and municipalities around Hannover were discharging their effluent into these streams through a number of obsolete treatment plants.

In 1969, in order to achieve an improvement of the situation, the Association of Municipal Corporations in the Greater Hannover District charged the City of Hannover with the development of a new concept for effluent purification in the core region of Hannover.

It was decided to construct a second large sewage treatment plant in Gümmerwald (Municipality of Seelze). This was connected underground to the sewage treatment plant in Hannover-Herrenhausen by a pipeline, and was to purify a large part of the effluent arising in the Hannover region and to discharge it into the river Leine.

The construction of the 13 kilometre long connecting pipeline, with a diameter of 1.40 m, was begun in 1976. Construction of the Gümmerwald Sewage Works also started in the same year. This, together with the new connecting pipeline, was finally commissioned in 1983.

Since this time, the effluents from the municipalities of Hannover, Garbsen, Gehrden, Hemmingen, Laatzen, Ronnenberg and Seelze have been collected together and purified to a uniform standard. Altogether, this sewage treatment alliance treats and disposes of waste water from about 750,000 people and effluent volumes from industry and commerce averaging about 180,000 cubic metres per day. About two-thirds of this is dealt with by the Gümmerwald Sewage Works and the rest by the Hannover-Herrenhausen Plant.

The two septic tanks are a prominent landmark of the Gümmerwald Sewage Works

Hannover

Stadtentwässerung Hannover

An agency of the state capital

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Stadtentwässerung Hannover wish to continue providing clean water, caring for the environment and safeguarding our natural resources in a safe, unobtrusive and cost-effective way for all the inhabitants of our city. In order to satisfy the needs of our customers for information, Stadtentwässerung Hannover are happy to answer your questions on the environment and give advice on how each of us can help to safeguard our water supplies.
Just ask.

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Sewage Works Gümmerwald

Any more questions? Please contact the Press and PR office of Hannover Sewage Services. Just phone +49 (0)511 1 68 4 74 60 or email us at 68.Presse@Hannover-Stadt.de.

Hannover

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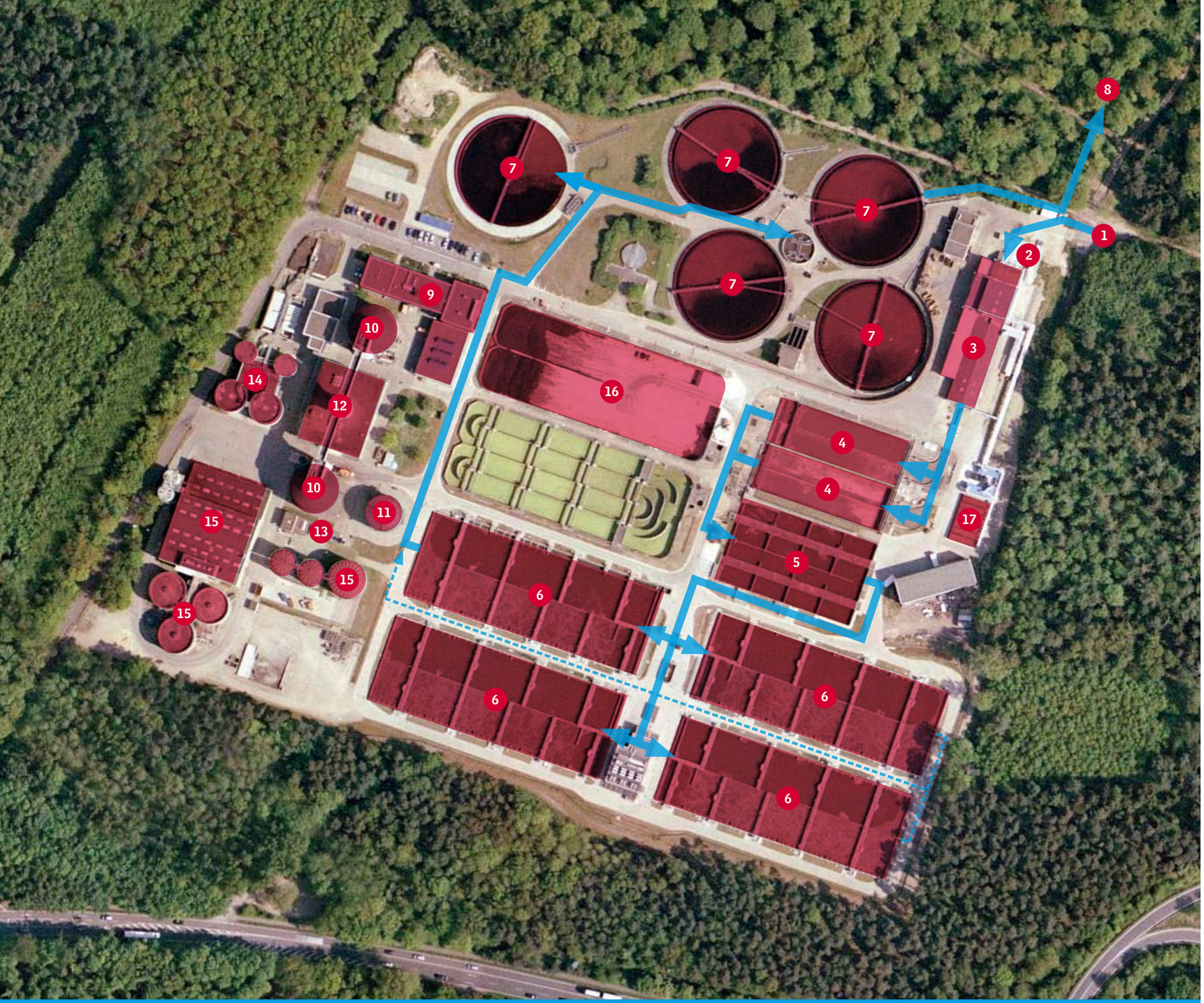

Gümmerwald Sewage Works

1. WASTE WATER INLET
2. INLET PUMPING STATION
3. SAND TRAP AND GRATING
4. PRIMARY SEDIMENTATION TANKS
5. ANAEROBIC TANKS FOR BIOLOGICAL PHOSPHORUS ELIMINATION
6. ACTIVATION TANKS
7. FINAL SEDIMENTATION
8. DISCHARGE INTO THE RIVER LEINE
9. CENTRAL CONTROL ROOM
10. SEPTIC TANKS
11. GAS TANK
12. CHP POWER PLANT
13. GAS FLARE
14. THICKENER
15. SLUDGE DEWATERING
16. INTERMEDIATE SLUDGE STORAGE
17. EXHAUST AIR TREATMENT

The course of waste water

MECHANICAL PURIFICATION

When the water arrives in the sewage works 1, all coarse materials are first filtered out. This reveals again and again how much refuse people dispose of through the sewerage system: razor blades, cotton buds, packaging waste, food remnants, hygiene articles, cigarette ends and much more. Such things, of course, do not belong in the toilet, but in the dustbin!

By means of a screw pump 2, the waste water is raised to the level of the purification plant. At the first stage, mechanical purification, coarse materials are filtered out by coarse and fine gratings 3 and disposed of at considerable expense. Almost three tonnes of domestic refuse still arrives every day at the grating units in the Gümmerwald Sewage Works. Then the water runs on into the sand trap 3. Here, it flows much more slowly, allowing suspended materials such as sand, grit and stones to settle to the bottom. These solids are then recycled. Fats and oils floating on the surface are also separated here and passed into the septic tanks.

At the next stage, the primary sedimentation tank 4, more undissolved substances are then sedimented out. These form the raw sludge that, by means of a scraper bridge, is heaped together and pumped into the septic tank. In the septic tank, the sludge is digested and broken down by bacteria. This process generates sewer gas, which is transformed into power by the gas motors 12. The remaining sludge is then dewatered 15. After mechanical purification, the waste water is about a third cleaner.

BIOLOGICAL PURIFICATION

Here, the remaining two-thirds of the impurities in the waste water are removed. From the primary sedimentation tank 4, the waste water first flows into an anaerobic tank 5. There, microorganisms break down the phosphates contained in the waste water in large quantities. The waste water then flows on into the activation tank 6. Here, millions of bacteria and microorganisms help to break down the substances still dissolved and finely suspended in the water. These are mainly phosphates, carbon and nitrogen compounds. In order to consume the impurities, the different microorganisms require either plenty of oxygen or no oxygen at all, depending on the species. The activation tanks are therefore divided into different zones in which the oxygen supply can be controlled.

Under these optimum living conditions, the bacteria multiply rapidly, forming bacterial colonies, the so-called activated sludge. In the final sedimentation tanks 7, the activated sludge is then separated from the purified waste water. Part is fed back into the activation tank, while the surplus sludge is pumped into the septic tanks 10. The purified water is now discharged into the River Leine 8.

ENERGY RECOVERY

The sewer gas formed by the rotting process in the septic tanks 10 is used to fuel a combined heat and power plant 12, where it is converted into electrical power by means of gas engines. In this way, about 60 per cent of the power consumption and 100 per cent of the heating for the sewage works can be covered.

SLUDGE UTILISATION

Using special chamber filter presses 15, the sludge is dewatered under high pressure. The sludge, which contains many nutrients, can now be used as fertiliser for agricultural purposes. Because of its very high calorific value, it is also suitable for thermal utilisation.