



Minworth

Sewage Treatment Works



Records show that a simple form of sewage treatment was carried out on the Minworth site, as early as 1870. This consisted of running sewage over fields and farming the land.

As Birmingham expanded rapidly during the industrial revolution, sewers were laid to local sewage works across the area. Over time these local sites have been closed and the sewers connected, via the Black Country Trunk Sewer system, to deliver sewage to Minworth. To cope with ever increasing flows and load the site has gradually been adapted to provide more intensive sewage treatment.

During the 1960s the site and process received a major upgrade with the installation of filter beds. Between 1999 and 2004, Severn Trent Water invested £19M to upgrade the site to an activated sludge plant in order to further improve the quality of the River Tame into which Minworth discharges. Between 2005 and 2010 a further £99M has been earmarked to enable more improvements to be made.

This site currently treats the waste from the equivalent of 1.7 Million people, which includes domestic and industrial discharges. In addition, sewage sludge from smaller works is tankered to the site for treatment. Modern technology enables us to utilise the biogas from the sludge treatment process to produce electricity for our own use and for resale.

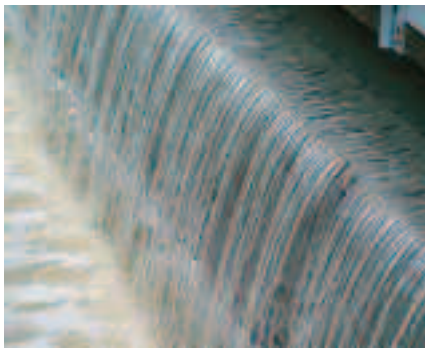


Inlet

On average 500MI/d of sewage arrives at the inlet via the two very large (2.5m and 4.3m diameter) sewers. Five screens and grit removal equipment take out material that could damage or block other treatment equipment and processes. Flows to treatment are controlled here and up to 6 storm tanks are brought into use as necessary.

Primary Treatment

Eighteen primary settlement tanks provide initial settlement for heavier organic matter and a scraper mechanism deals with the floating material like plastics, with heavier material sinking to the bottom to form



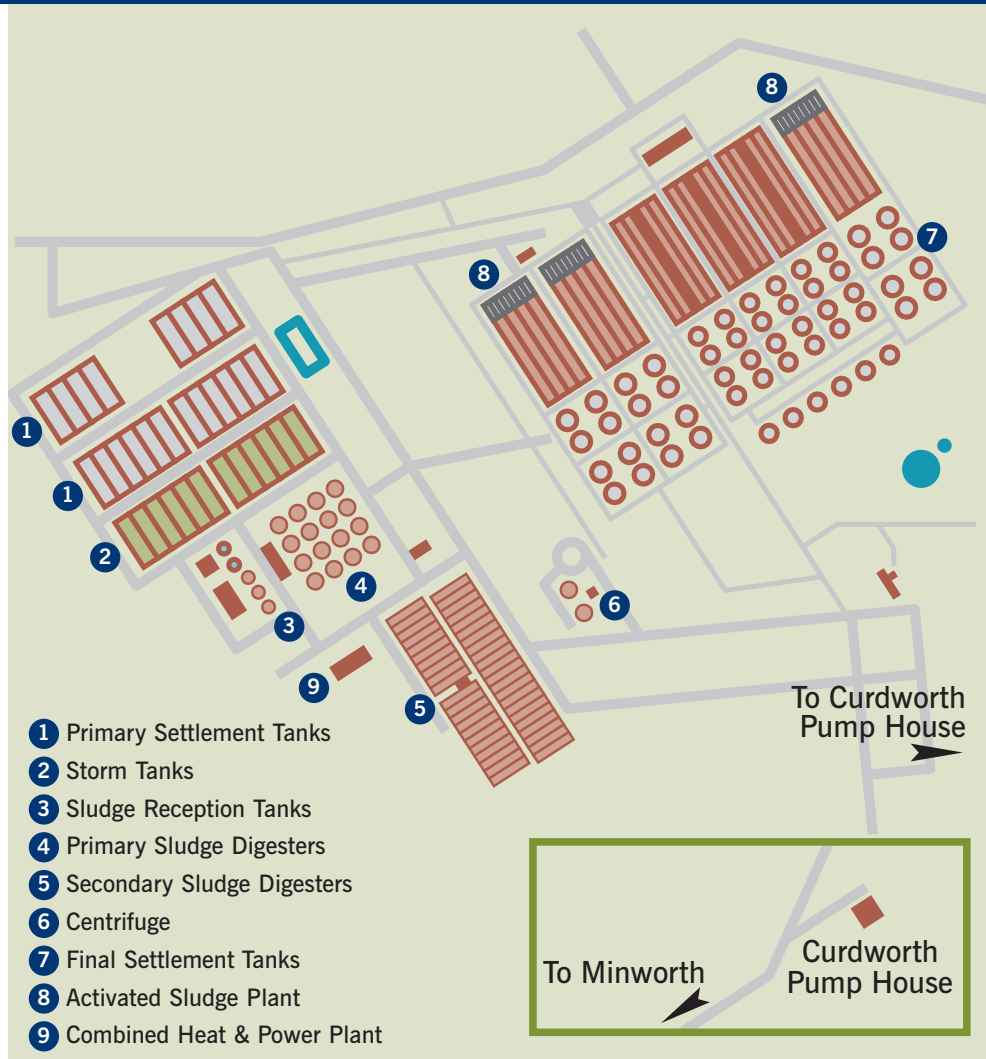
a primary sludge. The sludge is removed by pumps and transferred to another part of the site for treatment.

Secondary Treatment

Twenty four activated sludge tank 'lanes' are continuously fed with settled sewage. Each lane is the size of 4 Olympic swimming pools and is constantly mixed and aerated by blowers which bubble air up from the tank base. The oxygen requirements of the process are monitored and adjusted by sensors and the useful micro-organisms that carry out the breakdown of the settled sewage are recovered in final settlement tanks (FSTs) before being returned to the lanes. The overflow from the FSTs is discharged to the River Tame as a high quality final effluent.

Sludge Treatment

Sludge from primary treatment, surplus activated sludge and sludges from some smaller works are treated at Minworth. The first stage is digestion in 16 large enclosed tanks. This produces biogas which is collected in the floating roofs of the digesters. Liquid sludge is then made into a 'cake' in centrifuges which spin out surplus water.



- 1 Primary Settlement Tanks
- 2 Storm Tanks
- 3 Sludge Reception Tanks
- 4 Primary Sludge Digesters
- 5 Secondary Sludge Digesters
- 6 Centrifuge
- 7 Final Settlement Tanks
- 8 Activated Sludge Plant
- 9 Combined Heat & Power Plant

Recycling

Due to the nature of some industrial discharges, strict controls are exercised to ensure the preferred route of recycling treated sludges to agriculture is not compromised. Farmers in the area value the nutrient and soil conditioning properties of the sludge cake.

Energy Recovery

Seven large engines are used to convert the biogas produced by the digesters into electricity and heat. The heat is used to maintain the digestion process. Minworth can produce up to 22MWh/d of electricity from this renewable resource. This is more than is needed to run the works and the excess is sold to the national grid.



Conservation

Large areas of the site remain undisturbed and have naturalised into rough grasslands, scrub woodland and wetland. These habitats are home to a wealth of plants and animals all year round and provide part of a green corridor along the River Tame into the centre of Birmingham.

site facts

- Minworth is the largest of Severn Trent's sewage works
- Minworth treats the sludge produced from 2.5 million people due to tankered imports
- 6 Storm tanks have the capacity of 68MI of water
- Minworth's 7 CHP engines are named Wren, Brunel, Watt, Faraday, Newton, Stevenson and Bell