

HYBACS[®]

Municipal Sewage: Ashbourne, UK

Background

Ashbourne STW in Derbyshire is a municipal sewage treatment works (STW) which receives a large proportion of industrial effluent from a chicken processor in the town. Severn Trent Water received an application from the chicken processor to double production capacity. A subsequent review indicated that the oxidation ditches were already operating at 95% of their capacity and an upgrade was required. The objective was to boost treatment capacity from 25,000 to 35,000 population equivalent (PE), a 40% increase.

The discharge consent remained unchanged at 25 mg/l BOD5, 40 mg/l suspended solids and 10 mg/l ammoniacal nitrogen.

Severn Trent's team evaluated several options including construction of a third oxidation ditch, the addition of roughing filter towers, or the installation of submerged aerated filter (SAF) units. They selected HYBACS[®] as the preferred solution due to its low capital and operating costs, ease of installation, low carbon footprint and its robust performance, which had been verified by a two-year pilot trial at Severn Trent's Coleshill STW.



Solution

The HYBACS[®] upgrade at Ashbourne STW comprises four SMART[™] units, installed upstream of the oxidation ditches at the point where the return activated sludge (RAS) mixes with the settled wastewater. The SMART[™] units are high-rate bioreactors which are designed to remove up to 50% of the chemical oxygen demand (COD) in the wastewater, thus reducing the load on the oxidation ditches.

At Ashbourne STW, the addition of the SMART[™] units enabled the existing oxidation ditches and associated aeration system to be retained, without modification, as part of the upgraded works. The use of existing assets and the simplicity of the HYBACS[®] upgrade contributed to the low capital cost.

The SMART[™] units were assembled and tested before delivery to the site, reducing the duration and complexity of site work. The units were lowered onto a flat concrete base and the connection of pipework and power supply took just two weeks. Off-site manufacture reduces project costs, ensures a consistent quality of manufacture and reduces the risk of accidents.

Severn Trent's delivery partner, MWH, placed an order in January 2012 for the upgrade and Ashbourne STW was commissioned in June 2012.

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A BLUEWATER BIO TECHNOLOGY



Performance

Severn Trent's R&D team are collaborating with Bluewater Bio to monitor the performance of Ashbourne STW. A baseline survey was carried out between March and May 2012, followed by a second survey commencing in July 2012, just one month after commissioning.

Initial data confirm a high quality of final effluent:

- BOD5 4.6 mg/l on average
- Ammonia less than 0.4 mg/l

This improved performance is despite an increase of 14-25% in the incoming load since the baseline survey. The SSVI has also fallen to 70 ml/g, indicating a well-settling sludge.

Conclusion

Severn Trent identified HYBACS® as the lowest capital and operating cost solution for upgrading Ashbourne STW. The extensive use of off-site assembly brought further savings in cost and time, whilst reducing health and safety risks. The final effluent quality is excellent.



Severn Trent's CEO Tony Wray said:
"The HYBACS® system means that Ashbourne Sewage Treatment works can process over 40% more waste water at the minimum of expense and carbon emissions. Severn Trent aims to promote the highest standard while passing on the lowest charges to our customers, and this new plant is a fine example of how we put our business theory into practice."

To find out more about HYBACS® call:

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