

ELIQUO | HYDROK

Casestudy

IFAS and FBDA
Seaton Carew STW



TOTEX savings from an Innovative and Creative Technology

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Seaton Carew STW

Client: Northumbria Water

Installation Date: April 2016

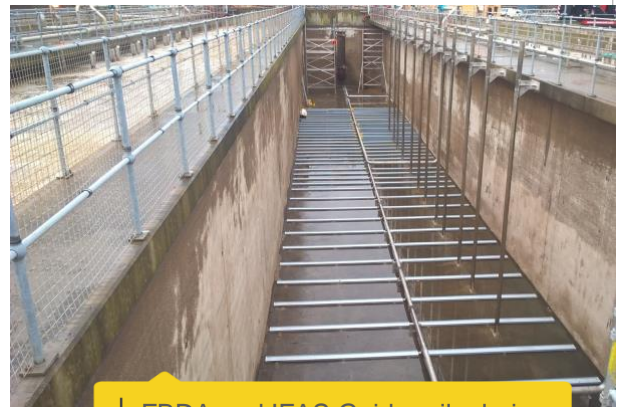
Flows from the South of Hartlepool are screened to 6mm and de-gritted at Seaton Carew headworks. Up to 950 l/s is then pumped inland via a 2km long, 900mm diameter, rising main to Seaton Carew Sewage Treatment Works. Here, it receives full treatment (primary, secondary and UV disinfection) before returning via a 2km long, 1200mm-diameter, gravity return pipeline to the Seaton Carew headworks. The recorded population equivalent is approximately 120,000. However, an assessment of actual flows and loads indicated a population equivalent of up to 250,000 due a combination of factors, including recent population growth and industrial activity.

Seaton Carew STW required a substantial upgrade to improve the asset condition, maintain performance and to provide extra capacity to accommodate both recent and predicted growth within the catchment. In 2013 a feasibility study was undertaken by asset delivery and the recommendation was to utilise an innovative and creative technology to provide the extra treatment capacity required.

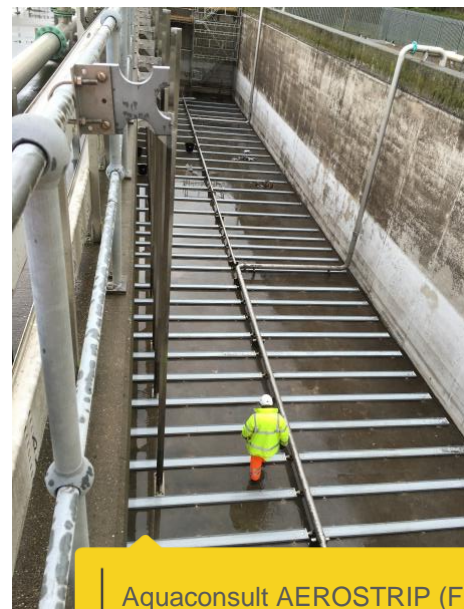
A new approach as a solution

A combination of the ELIQUO HYDROK Integrated Fixed-Film Activated Sludge system (IFAS); which utilises a Biotextil Cleartec material; and the Aquaconsult AEROSTRIP Fine Bubble Diffused Aeration (FBDA) system, installed within the existing four aeration lanes provide the additional treatment capacity. The alternative to this was to build two additional aeration lanes, at a capital cost of approximately £2 million more.

The whole life cost, incorporating power and maintenance etc. is also less.



FBDA and IFAS Guide rails during Installation



Aquaconsult AEROSTRIP (FBDA) fitted into existing lanes



FBDA pattern test following installation

Biotextil Cleartec is a woven textile utilising 100% polypropylene, to create a large specific surface area on which biomass can grow. The construction of the material permits good oxygen supply and prevents excessive growth of thick layers of biomass, maintaining the optimum efficiency of the process.

The Biotextil Cleartec curtains are positioned directly above the diffusers, housed within a removable stainless steel frame, setting them parallel to the flow. The configuration of the material allows for flexibility and movement within the flow of the tank, leading to an enhanced performance, which in turn increases the capacity of the sewage treatment works.


To maximise the volume capacity of the treatment tank, the Biotextil Cleartec curtains are positioned between 40cm and 60cm above the diffusers. The best possible scenario is the combination of the low profile fine bubble diffusers and the Biotextil Cleartec media.

The curtains are set to allow the flow to pass between them horizontally, with the diffusers creating a vertical flow. As a result, the curtains are in constant motion and this 'shaking' controls the biomass thickness, preventing blockages, maintaining optimum efficiency and minimising the energy requirement.

In May 2015, Northumbrian Water asset delivery awarded a design and construct contract to Interserve Construction Limited for £8.3 million. This contract was an amalgamation of works to be undertaken at Seaton Carew headworks, Seaton Carew STW and Tudhoe Mill STW. This batch of work under one contract was to deliver efficiencies whilst also acting as a trial to assist in establishing lessons learnt to contribute to the new operating model that asset delivery is developing.

Since contract award, Northumbrian Water asset delivery, waste water operations and maintenance have been working collaboratively as one team with Interserve Construction Ltd and their sub-contractors and suppliers to progress the works safely and ensure that the works consent is not compromised.





At Seaton Carew sewage treatment works the first lane with the new IFAS and FBDA technology was commissioned on 17th of February and the remainder of the lanes were completed by the end of April 2016.

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