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## A HUBER Technology Sludge Thickening case study

### Background

In 2017, United Utilities started work on a four-year improvement project at Blackburn and Darwen WwTW. This work included:





*Photographs taken during the installation phase*

- Extending the current works at Blackburn WwTW to construct new tanks, buildings and improve the treatment process.
- Taking existing wastewater flows from Darwen WwTW through to Blackburn WwTW by installing a new connecting pipe and upgrading the existing tanks.
- Constructing new storm tanks and new pipeline to transfer wastewater to Blackburn WwTW from Nabs Head WwTW.

Blackburn WwTW treats principally domestic crude sewage from the Blackburn catchment, with two major additional contributions; a high strength trade effluent from a brewery and an ammonia rich return liquor flow from the sludge treatment plant. It was identified at an early stage the benefits of maintaining a gravity solution through the treatment process, taking advantage of the natural topography of the site and avoiding the need for the ongoing costs of interstage pumping.

#### **Scope of the project**

A new inlet channel to feed a 72,000m<sup>3</sup> in situ concrete structure was built to house the innovative Nereda® aerobic granular biomass technology. The Nereda® system treats crude sewage that has only received preliminary treatment and has been developed to treat the full flow and peak load at the works; i.e. a complete replacement and expansion of the existing wastewater treatment plant with a flow to full treatment (FTFT) of 3,000 l/s.

The Main Contractor awarded the sub-contract to HUBER Technology in 2019 for 3x HUBER Rotary Screw Thickener **S-DRUM** sludge thickeners designed to process sludge arising from the Nereda® process. This contract followed on from a similar project United Utilities completed at Kendal WwTW where again, the **S-DRUM** sludge thickeners process sludge arising from the Nereda® process.

#### Sludge thickening process requirements:

Sludge type	From the Nereda® process
Maximum dry solids content of incoming sludge	0.80 %
Maximum outlet sludge concentration	5.0 – 8.0 %
Maximum throughput required	153 m <sup>3</sup> /hour
Operating periods	Up to 24 hours per day 7 days per week
Mode of thickener operation	Duty/assist/standby
Solids recovery minimum	95%

#### HUBER Technology scope

The design, manufacture, supply, delivery, mechanical installation, of:

- 3 x (duty/assist/standby) HUBER **S-DRUM 4L** sludge thickeners c/w flocculation reactors.
- 3 x sets of polymer mixing valves and injection rings.
- 3 x thickened sludge pumps.
- Commissioning and the training of O&M staff.

The majority of **S-DRUM** sales have been used for thickening SAS, co-settled and mixed sludge from conventional processes. The experience gained dealing with sludge arising from the Nereda process will showcase the S-DRUM for the increased take up of this process in the future.

Unlike other drum thickeners that are predominantly installed horizontally, the S-DRUM is installed at an angle i.e. inclined. This has several advantages, with the main one being there is no requirement to elevate them on support platforms to enable thickened sludge pumps to be located under the sludge discharge point. This can significantly reduce the cost and the time taken to complete the installation of the overall solution as well as reducing the overall carbon footprint.

Other advantages include:

- 20% reduction in operating costs versus GBT's.
- 50% reduction in maintenance costs.
- Low energy requirements.
- Lower volume and pressure washwater demand.
- Less susceptible to ragging.
- Slow rotation/operation results in significantly less wear.
- Robust stainless steel wedge wire 'screen' built to last the asset life of the equipment.

Dale Foster, HUBER Technology's Area Manager commented, "It was great to secure the first contract to supply our S-DRUM sludge thickeners within the United Utilities area for the Kendal WwTW Project and even better to receive a second contract to supply them on this high profile Blackburn WwTW project. I have tracked the performance of the S-DRUM's since I started with HUBER technology over 25 years ago and I am confident they will prove as popular and reliable as they are in many other areas of the UK and Ireland."

#### A member of the HUBER Group

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