

The whey forward

Norco Foods is floating a fresh approach to wastewater which it hopes will offer a more compact and effective treatment process, writes **Louisa Hearn**.



WASTEWATER discharged from food processing plants is officially in the spotlight, with regulators increasingly demanding more stringent treatment before it reaches public waterways.

In light of these concerns, Norco's food division has begun implementing Dissolved Air Flotation (DAF) and Moving Bed Biofilm Reactor (MBBR) technology from Aerofloat at its Labrador facility, with high hopes the units can provide a more compact and effective treatment process.

Norco was founded in Byron Bay in 1895 as a regional milk processing cooperative, and its contract manufacturing division processes a broad portfolio of dairy products. These include milk and ice cream for its private-label and foodservice customers worldwide.

According to Norco, it's the wastewater from the clean-in-place procedures that follow dairy product processing that typically contain most suspended fat, plus suspended and dissolved protein and lactose contaminants. Its goal is to remove these in the most efficient way before water is discharged.

The Labrador facility, located at Coombabah Queensland,

has, in recent years, relied on an aerated lagoon-based treatment system for this task.

"We have an aerated pond out the back which is treating the wastewater, but our facility has increased production by 50 per cent over the past three years," Allan Box, business development manager at Norco Foods, says.

Box, who oversees new installations and projects for the plant operations, says this increase in production has also coincided with ever-tightening water discharge regulations from Gold Coast City Council, the local water and sewerage authority in the region.

LOOKING LONGER TERM

Norco Foods decided to install an enhanced water-treatment system located within its own site boundary as a longer term solution.

"We had got to the point where we had to do something," Box says.

"We were going to install a new wastewater treatment plant and just needed to establish what was the best solution for us."

He commissioned environmental consultants ENV Solutions to evaluate some different DAF solutions

in the market. Box also considered a number of alternative multi-million dollar waste management options, including bioreactor solutions able to generate biogas from the waste water.

"These solutions didn't stack up financially, so we came back to DAF," he says.

ENV Solutions conducted an independent comparative

wastewater in the event of a milk spillage.

Wastewater from the blending tank is treated by coagulation and flocculation in an Aerofloat DAF to remove the suspended contaminants, being fat and casein protein from the wastewater.

About half of the DAF effluent is then treated in the Aerofloat MBBR – which is a

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analysis of different solutions, and the Aerofloat DAF system was the one it recommended.

Box says Norco employees travelled to New Zealand to see a similar project installation for Westland's Milk, and agreed to move forward with the Aerofloat solution.

THE TREATMENT PLAN

The Norco project scope treats 450 m³/day of wastewater from the site. Wastewater is pumped to a balance tank for blending and hydraulic balancing, and pH correction. An emergency storage tank is also provided to store

biological treatment process that degrades the soluble sugars and whey protein in the wastewater.

The excess bio-solids produced by the MBBR process are then removed by a second Aerofloat DAF. The treated effluent from the second DAF is mixed with the remaining effluent from the first DAF prior to discharge to sewer.

The first-stage DAF and the MBBR process was installed to ensure a higher quality of treated effluent and to provide provision for growth in production.

Box says Norco Foods runs

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★ TECH TALK

WASTEWATER WINNERS

Established in 2009, Aerofloat designs, manufactures and installs wastewater treatment systems for a range of industries based on two key technologies – the Aerofloat Dissolved Air Flotation (DAF) and Moving Bed Biofilm Reactors (MBBR).

Managing director Ray Anderson has spent the past 45 years working in the wastewater treatment industry, and has installed over 600 biological wastewater treatment plants.

He established Aerofloat in 2009 to create technology designed to help processing facilities meet increasingly strict discharge requirements.

The Aerofloat DAF has a patented scum removal system which eliminates the need for mechanical scrapers. Its 60-degree hopper bottom enables any fallen solids to be recirculated through the saturator – essentially creating a self-cleaning mechanism. This also overcomes the need for pumping the float material to the sludge thickening tank.

Sealed and vented tanks create an odourless treatment plant, with lower maintenance demands thanks to the mechanical simplicity of the design and the self-cleaning hopper bottom.

Its MBBRs use aeration diffusers/lances which penetrate the side wall of the polyethylene tanks.

The aeration lances can be removed from the system, cleaned and maintained while the system is still operating, and without the need to remove the bio media like traditional MBBR systems.

MBBRs contain both suspended growth and fixed film growth for a more effective biological process and can also reduce the maintenance and operational costs of cleaning and replacing the membranes in the bioreactor. They are also sealed and vented to minimise odours.

“Aerofloat has numerous project examples where its technology has consistently met strict discharge requirements while managing high concentration and variable influent wastewater,” Anderson says.



ABOVE: The implementation of Dissolved Air Flotation (DAF) and Moving Bed Biofilm Reactor (MBBR) technology from Aerofloat is underway.

more traditional DAF units on other sites, which use scrapers to remove scum, demanding more maintenance and staff supervision.

With no moving parts, he anticipates that Aerofloat’s solution will prove far easier to operate than these.

“With these new units, we’re hoping we can do a daily check to make sure it’s working alright, and then let it run itself,” he says.

“If this works out as we hope, then Aerofloat may well become the solution for our other plants when existing DAFs reach their end of life.”

A COLLABORATIVE DESIGN

Prior to installation, Box worked with Aerofloat on the system design and then its technical staff came to the site and installed the units.

“We have a dedicated shed for the Aerofloat units, and a number of water holding tanks,

with two of them running in parallel and the other two in series behind that,” he says.

The installation of the five DAF units is now almost complete.

“Now our people are getting involved to find out all the ins and outs of how it works,” Box says.

Also, because the Aerofloat tanks are fully enclosed, Box says this should eliminate the odours associated with older units that operate by

450
CUBIC METRES OF
WASTEWATER WILL BE
TREATED PER DAY

scraping sludge off the top of the tank.

“Our factory was once way out in the countryside, but the local community has spread, and is now all around us,” Box says.

This makes it even more important that Norco Foods ensures wastewater and environmental considerations are being met.

“The regulations for wastewater are getting tighter and tighter, and as good corporate citizens we need to meet these new standards,”

Box says. ★