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POTABLE REUSE

Europe's first potable reuse scheme opens in Sweden

A Swedish island in the Baltic will soon become the first area in Europe to be supplied with drinking water from reclaimed wastewater.

September is set to mark a major watershed for water recycling in Europe with the start of production at a first-of-its-kind facility treating wastewater for use in the drinking water supply.

Starting next month, drinking water for the southern half of Sweden's water-stressed island of Öland will be supplied from an innovative plant combining brackish water desalination with industrial wastewater reuse, using technology from Luxembourg-based industrial water treatment specialist Apateq. The move is believed to make local body Mörbylånga the only municipality in Europe to supply residents directly with reused wastewater. The plant will mix pre-treated effluent from a food processing plant with brackish water from coastal wells before treating the resulting solution in a single treatment train.

The idea for this unusual setup gradually took form as the island reeled from a severe drought in the summer of 2016, Peter Asteberg, the municipality's project manager for the plant, told GWI, adding: "We had to transport drinking water on trucks from the Swedish mainland and that cost us a lot of money, of course. That was when this project was initiated." Initial plans for a regular desal facility were then merged with a long-running wish to reclaim process wastewater from the slaughterhouse.

Perhaps ironically, at a time when Brussels is putting the finishing touches to a new EU regulation on reuse (*see GWI July 2019, p24*), Sweden's absence of a specific law may have helped the project. Potable reuse "has not been discussed at all in Sweden", Asteberg explained. "We discussed this a lot with our authorities, and they said the only requirements that they have are the same as any drinking water, and that we should install sufficient microbial barriers." This is in sharp contrast to Spain, for example, where the legal framework surrounding the country's many agricultural reuse schemes explicitly prohibits potable reuse.

Mörbylånga refrained from going all the way, though: recycling municipal sewage was considered, but quickly discarded. "We said, 'We'll start with this industrial water', we think the [psychological] step in using industrial wastewater is not as big as with municipal wastewater", Asteberg explained, adding: "people need to get used to the thought."

Two pilot projects – one from GE Water (now Suez WTS) and one from Swedish firm Björks – were already initiated when Apateq got wind of the project, Apateq chief sales officer Dirk Martin told GWI this month. "We felt confident that we could have a single unit to address both types of water," he said. The treatment train Apateq envisioned combines permanganate oxidation with ultrafiltration and reverse osmosis. The treated effluent is then UV-disinfected and remineralised to comply with drinking water regulations. Engineering firm Norconsult designed the latter stages, as well as a new pre-treatment plant for the effluent exiting the slaughterhouse's existing WWTP.

The benefits of Apateq's solution, Martin argued, lay not only in reduced capex, but also energy efficiency. "If you mix the waters, you bring the salinity down, and by consequence, you don't have to overcome a high osmotic pressure anymore," he said, adding that this would mean saving on electric consumption from pumps.

The plant manages to keep constant proportions in its influent mix thanks to a system of sensors and flow meters. According to Asteberg, Apateq's software expertise has resulted in a system where "the two sources can be blended in many different ways, so it was the most flexible solution." Mörbylånga agreed to have the Luxembourgish firm run its own pilot in 2017 alongside the others and eventually awarded them the contract after an open procurement process.

To adapt to seasonal demand swings – many Swedes have summer homes in Mörbylånga, which sit empty the rest of the year – the treatment unit is divided into parallel "banks" that can be activated or deactivated as needed. As a result, the plant's operating capacity can range from 500 to 4,000m³/d depending on demand.

This is not a typical project for the Luxembourg-based company, which specialises in water solutions for the oil & gas and shipping industries. "When we founded Apateq, to be honest, we said we will never go into drinking water," recalled Martin. "However, when we heard about the uniqueness of this project, with the direct reuse, we thought: 'We can do that!'" Now, faced with enthusiastic responses from other Scandinavian municipalities to what Martin described as "an opportunistic project" for the company, he says Apateq might just reconsider. ■

A ROYAL WELCOME FOR WASTEWATER REUSE

Prince Félix of Luxembourg and Crown Princess Victoria of Sweden at the official opening of the Mörbylånga direct potable reuse facility in July.

Source: Apateq