

Settling for nothing but the best

18th November 2022

Nordic Water's Zickert technology gives new lease of life to 70-year old Argentine water treatment facility.

One of Argentina's most important water treatment plants has completed a transformation of its sedimentation tanks. It has increased its capacity, vastly improved its reliability and reduced its environmental footprint following the installation of Zickert sludge scraper technology from Nordic Water, a Sulzer brand.

Constructed in 1950, the Donato Gerardi treatment plant provides drinking water to 800'000 people in the province of Buenos Aires, Argentina. As the facility approached its 70th birthday, however, its age was beginning to show. Performance had declined over the decades, and operator Aguas de Buenos Aires SA (ABSA) knew that major upgrades were required.

In 2017, the state-owned utility contracted multinational water and energy specialist Veolia to undertake a comprehensive refurbishment of the facility. The aims of the project were to increase capacity, introduce new technologies, and deliver a plant that was ready to meet the demands of the 21st century.

One key part of the upgrade program focused on the facility's 14 large concrete sedimentation tanks. The Donato Gerardi plant draws its water from the nearby Rio de La Plata, and the raw water contains high, and variable, quantities of suspended

solids. In the rainy season, when turbidity levels often rise to 500 NTU , these tanks would rapidly accumulate large volumes of sludge that could only be removed manually with hoses, which meant it was common for the sedimentation system to be overwhelmed.

ABSA and the contractor wanted to fix the problem with the installation of a modern, automated sludge removal system. After a competitive tendering process, they selected Nordic Water's Zickert technology.

Concentrated advantage

The Zickert bottom sludge scraper uses a reciprocating framework of hydrodynamically shaped profiles mounted on the base of a sedimentation tank. When they move in one direction, these profiles catch the layer of highly concentrated sludge at the very bottom of the tank and move it towards a disposal outlet. In the other direction, the shape of the profiles allows them pass through the sludge with little disturbance.

This method of operation allows the scraper to remove waste with a very high concentration of solids, which means less waste for the operator to handle and higher overall process efficiency. The Zickert system is also extremely simple and robust. Its drive system has only four moving parts, with power provided by a single hydraulic actuator. Energy consumption is low and there are no bearings, gears, chains or other vulnerable mechanical components.

ABSA was confident of the performance of the Zickert system, since it already used the technology at several other plants across Argentina, and had even run comparative evaluations of different scraper systems at one of its sites. The results highlighted that Zickert gave the best solution in terms of solids removal and sludge

concentration. There was only one catch: the tanks at Donato Gerardi had been built with a V-shaped base profile that wasn't designed to accommodate a bottom-mounted scraper system.

Setting the baseline

To resolve the compatibility problem, Nordic Water and Veolia came up with a simple solution. They used lightweight concrete to fill the bottom profile of each tank, creating a flat surface ready for the new scrapers. To maintain plant operation during the upgrade, this process was completed one tank at a time, allowing the other 13 units to keep working.

In all, a total of 28 scrapers were supplied to the project, with two installed in each of the plant's 42 meter by 11 meter tanks. They have performed effectively since their installation, removing an average of 400 m³ of sludge per hour from the raw water and ensuring that turbidity never exceeds 3 NTU at the decanters.

Automating sludge removal has eliminated the labor-intensive job of manual tank cleaning, and the sludge generated by the system contains more than twice the concentration of solids than before, which significantly reduces the labor and energy required to transport the material for safe disposal. As part of the changes across the site, the new system has almost doubled the capacity of the plant, from 8'000 to 15'000 m³ of clean water per hour.

Clear benefits

"Zickert sludge scrapers have a record of good performance at many of our other sites, so we were confident the technology would deliver at Donato Gerardi too," says Daniel Castro, ABSA plant manager. "Thanks to the expert technical and

practical support Nordic Water provided throughout this project, we can now benefit from a highly effective scraper system.

“The upgrade was a large, complex project on an operational facility. One of the many strengths of the Zickert system is speed and simplicity of installation. Nordic Water was able to deliver an efficient, reliable and environmentally sustainable solution.”

“We have worked together with ABSA very successfully for many years,” says Javier Casal Mosquera Technical Manager at Nordic Water LA. “I’m extremely proud that our technology was selected for such an important project, and that we could deliver exactly what our customer needed to address a longstanding challenge at this facility.”

Image captions:

Image 1: Zickert sludge scrapers were supplied to ABSA increase its capacity and reliability of their sedimentation tanks.

Image 2: The Zickert bottom sludge scraper uses a reciprocating framework of hydrodynamically shaped profiles mounted on the base of a sedimentation tank.

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