

Reclamation relieves water stress in Tarragona

The Camp de Tarragona Water Reclamation Project is relieving water scarcity in Spain's Tarragona province, efficiently treating municipal secondary effluent to meet local industry's process water needs, allowing fresh water to be used for municipal drinking water supplies, and delivering multiple sustainability benefits. **William Mengebier** reports.

Spain's Tarragona Province on the Mediterranean coast needs water. To meet increasing water demands, the Catalan Water Agency, Asociación Empresarial Química de Tarragona (Chemical Industry Association of Tarragona), and Aguas Industriales de Tarragon, S.A. (Tarragona Industrial Water Association) selected the French company Veolia Water Solutions & Technologies as its technological partner to develop a solution.

The region had been relying on water transfers from the Ebro River to meet domestic and industrial consumption needs through a supply system constructed in 1989, but increasing demand had outpaced system capacity. Water shortages had been worsening, especially during summer months, as a result of low average rainfall and high water consumption demands from industrial clients and increased tourism in the region.

Following a nine-month demonstration project, Veolia designed, built, and is currently operating – in joint venture with the industrial end users – a major water reclamation network, the Camp de Tarragona Water Reclamation Plant. The plant, which began operating in October 2012, reclaims water from treatment plants serving the Tarragona and Vila-Seca i Salou communities, applying tertiary treatment through reverse osmosis as its main process. Companies operating in Tarragona's Petrochemical Complex industrial zone use the reclaimed water primarily in cooling towers.

Veolia installed an enhanced physico-chemical pre-treatment process to address high water quality variability and meet the high water quality criteria required by industrial end users. Municipal wastewater is passed through Veolia's Actiflo® coagulation-flocculation and ballasted settling system, followed by its Hydrotech™ Discfilter microscreen filtration technology, and then two-stage sand filtration. The pre-treatment solution offers efficiency

in removing high concentrations of total suspended solids and organic compounds from secondary effluent, thus preventing organic fouling and biofouling in the reverse osmosis (RO) stage.

The RO system operates with double pass to address the high ammonia concentration of the treated effluent and ensure compliance with the inlet values required by industrial end users for ammonia (0.8 mg/l). A final water disinfection step occurs prior to distribution in compliance with Spanish water standards for industrial applications. The system treats secondary effluent from two municipal wastewater treatment plants and produces 19,000 m³/d of high-quality reclaimed water for industrial use.

During the first year of operation, the Tarragona Industrial Water Association worked to convince potential users of the technical and economic advantages of using reclaimed water produced by the new Veolia-managed system. Repsol and Dow Chemical were the first industrial users of reclaimed water to supply cooling towers, demonstrating the benefits derived from the quality and reliability of reclaimed water compared with using surface river water from the main water supply system.

More companies have begun to use the reclaimed water as the results and advantages, in terms of production, quality, distribution and maintenance of the reclaimed water system, have been demonstrated at a series of technical meetings with other industrial users. Companies have also started to realize the economic and strategic advantages in relinquishing surface water rights in exchange for more reliable and high quality reclaimed water.

One of the advantages of Veolia's new system is Actiflo's ability to guarantee reduced turbidity levels at the inlet of the dual media filters, even when turbidity at the inlet increases dramatically. The reclaimed water



In the Camp de Tarragona Water Reclamation Plant, effluent passes through an enhanced physico-chemical pretreatment process before reaching the reverse osmosis stage. Photo by Veolia Water Solutions & Technologies

has an electrical conductivity of approximately 20µS/cm and a total organic carbon (TOC) level lower than 0.2 mg/L, thereby allowing for its normal use as feed water for demineralization processes by ion-exchange resins. Additional companies have begun to use reclaimed water as a result of these demonstrated advantages.

The Camp de Tarragona Water Reclamation Plant is a model of sustainable development. Before the project was completed, municipal tap water was used for industrial needs, but this tap water is now available for public supply, thereby preserving a valuable finite natural resource. The Tarragona project demonstrates a regional solution to water scarcity and a technological solution to reducing environmental pollution – by reclaiming wastewater that would otherwise have been discharged to the sea. Such processes make possible continued industrial growth in water-scarce regions through improved industrial sustainability.

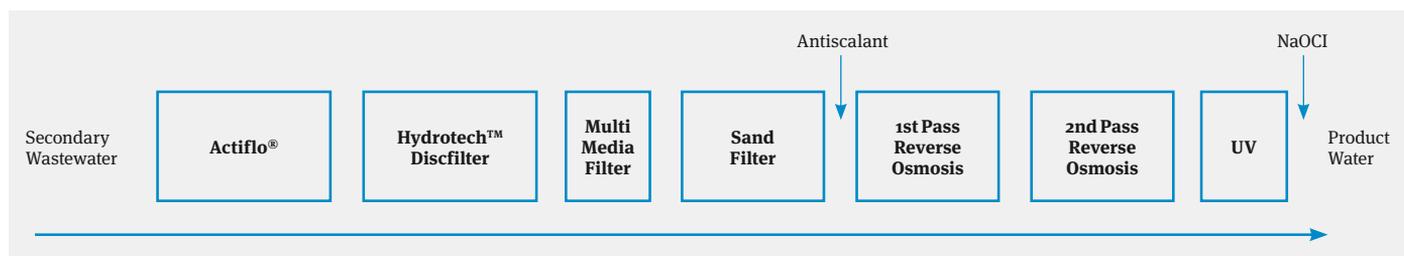


Figure 1. Process flow diagram of Camp-Tarragona Advanced Water Reclamation Plant