WASTEWATER TREATMENT FOR BREWERIES

CASCADE BREWERY
TASMANIA, AUSTRALIA
AUSTRALIA’S OLDEST BREWERY IMPLEMENTS STATE-OF-THE-ART EFFLUENT TREATMENT PLANT

It was the clear water of the Hobart Rivulet that inspired pioneering industrialist Peter Degraves to found the ‘Cascade Estate’ in 1824. In his sawmill, the water-powered machinery produced the timber that built many of Hobart’s first houses. When the forests thinned and the town had grown, Degraves came up with another noble cause for Mount Wellington’s pure water. The Cascade Brewery was born in 1832 and continues in operation up to the present day, making it Australia’s oldest operating brewery. Cascade Brewery Co. Ltd today, being part of Australian major brewery group: CUB, is owned by one of the world’s major brewery players: SABMiller. Throughout its long history the Cascade Brewery Co. Ltd has been of considerable economic importance to Tasmania, and is a classic example of Australia’s industrial heritage.

The brewery had always been connected to the municipal sewage system operated by Taswater. With an average of 700 m³ of wastewater per day and a COD above 6000 mg O₂/l, the brewery wastewater accounted for a major part of the organic loading of Hobart’s municipal wastewater treatment plant. To meet increasingly stringent legislation on industrial trade waste discharges, it became inevitable for Cascade to modernize their internal sewage infrastructure. First step in this direction was the separation of domestic and trade waste streams. A second step was the installation of the sewage infrastructure including an effluent pump station. At this point the brewery was ready for the final keystone project.

In 2012 Waterleau was contracted on a turnkey basis to design, build and commission a state-of-the-art wastewater treatment plant for the Cascade Brewery. With this plant, Cascade Brewery would meet the latest imposed discharge limits and avoid the ever increasing charges related to trade waste disposal, resulting in a very short return of investment. The project kicked off in the beginning of 2013. Construction was completed by June 2014 and the plant was commissioned and up and running in August 2014.

The plant consists of a fine screen, equalization tank, pre-settler, anaerobic treatment plant and a re-aeration tank. The heating heat of the plant is a LUCAS® UASB, or Up-flow Anaerobic Sludge Blanket reactor. The biogas produced in the anaerobic digestion process is used by the brewery’s boilers for steam production: a clever new energy solution! Because of the wide range of production activities happening at the Cascade Brewery, Waterleau designed a plant allowing for maximum flexibility. A lamella plate settler is included, which can operate as a pre-settler to remove excess solids prior to anaerobic digestion, or as a final clarifier. In combination with the re-aeration tank, this settler even allows for an aerobic, activated sludge type post-treatment to be implemented in low flow conditions. To minimize odor nuisance, all covered tanks are put under a slight negative pressure and off-gases are injected in the re-aeration tank, oxidizing all H₂S and other odorous compounds.

The plant reaches COD removal efficiencies above 95%. On average, the final effluent COD is around 200 mg O₂/l. The low-loaded wastewater now discharged into the city’s sewer system drastically lowers the pressure on the municipal wastewater treatment plant, which makes an enormous difference in the brewery’s environmental impact. 190 years after Peter Degraves put the clear water of the Cascades to work, the Cascade Brewery took another pioneering step for Tasmanian industry: one towards a cleaner world.