A reverse osmosis system at Origin Wines.

SUSTAINABLE WATER EXPERTS

WATER AND SANITATION SPECIALISTS, SUSTAINABLE ENGINEERING CONSULTANTS (SEC), HAVE DESIGNED AN EFFICIENT AND COST EFFECTIVE SCALABLE WASTE WATER TREATMENT PLANT SPECIFICALLY FOR THE WINE INDUSTRY.

To date SEC has successfully designed, supplied, installed, and currently maintains, three waste water treatment plants for cellars such as Beyerskloof, Kanu and Olifantsberg, with successful remediation and implementation plans for cellars as large as Orange River Cellars. In addition, SEC has also supplied water purification plants to wine producers Paul Cluver, Molteno (Wintersdrift), Kanu and Origin Wine.

The compliance of cellar effluent with discharge standards are predominantly monitored and audited by the Integrated Production of Wine (IPW) and Department of Water Affairs (DWA) officials and according to SEC marketing manager, Luke Davidson, the IPW audits are becoming more and more stringent.

"This means that the pressure on winemakers to not only be water wise within the cellar and winemaking process, but also be compliant with the IPW guidelines and regulations, is ever increasing," he says. "However, we believe that winemakers care about the environment and would like the best processed water for their cellars. This makes the right choice easy."

SEC managing director Meyer de Villiers explains, "Our team of experts includes four civil engineers, one chemical engineer and a number of artisans – together we are more than qualified to provide turnkey solutions for waste water from wineries in order to comply with regulations."

According to Beyerskloof winemaker Anri Truter, it has been great working with such a professional and experienced firm. "SEC not only designed and installed a very effective waste water treatment plant, but has continued to service the unit on a monthly basis at a very reasonable price. It is the first time that Beyerskloof has been able to recycle its water through the irrigation system and should we not need to, the water is of such a quality that we can release it into the Plankenburg River."

SEC has installed over 50 waste water treatment plants and water purification plants all over Africa, including Rwanda, Angola, Zambia, Nigeria and the DRC. "Our footprint in South Africa is becoming very evident, as we are making inroads in the wine, dairy and food processing sectors with innovative solutions and cutting edge technology," says Luke.

"We are currently building a membrane bioreactor (MBR) waste water treatment plant for the biggest soya processing plant in South Africa that would be able to treat 300 000 litres of effluent per day to special standards. This means that the Chemical Oxygen Demand (COD) count will be less than 30 at all times," he says.

This water can then be reused in the cooling system or for irrigation of the gardens, negating the need to add to the already overloaded municipal system. MBR technology can also be employed to treat winery effluent. According to SEC's head process engineer, Luan Schoeman, this has been done very successfully in Spain and they would like to roll out the technology in South Africa.

The waste water treatment plants come in two basic structures: the Sabre, a concrete structure, and the Cobra, a pre-fabricated containerised unit. The waste water or effluent is treated in an activated sludge biological reactor. This biological reactor uses natural bacteria to break down the organic matter and convert the waste into stable sludge, treated effluent and gasses such as CO_2, methane and N_2.

Three main groups of bacteria are active in the bioreactor, namely anaerobic, aerobic and anoxic. The returned aerobic sludge is starved of oxygen in the anoxic tank, resulting in a de-nitrification process. There is also a final settling tank at the end of the biological process to separate the sludge from the clarified fluid.

The complete method mostly resembles the five-stage Phoredox process, except that it reuses the aeration chamber and has been registered in accordance with the Design Act of 1993.

The waste water treatment plant can furthermore be fitted with additional fats, oils and grease separation chambers; biogas or methane gas capturing facilities; membrane bio-reactor (MBT) units; as well as a reverse osmosis unit for complete reuse (drinking water standard) of treated effluent. The units are mostly odourless, require very little energy and are fairly simple to run.

SEC utilises Organic Water Solution's (OWS) Oxy-portfolio products, which aids in the breakdown of chemical compounds and sludge, and reduces the bad odours that effluent produce. According to Luke, this is often a starting point for many cellars before actually installing a waste water treatment plant.

The sewage works for mixed effluent water at Cavalli Wine and Stud farm.

Orange River Cellars' odour treatment system.

"The OxyCure product is being used in various sectors with tremendous success, but continues to dominate in the wine industry due to its natural ingredients and ability to introduce sufficient amounts of dissolved oxygen and micro digestive organisms into the effluent stream," he says. "Waste water treatment is a profession that requires a wealth of knowledge and a depth of experience which SEC is able to deliver."

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