GreenCape

2021

CaseStudy

Warwick Wine Estate's wastewater reuse project provides financial and sustainability benefits

Warwick Wine Estate,
Stellenbosch, Western Cape

The new 23 kl/d MBR[1] wastewater reuse plant was supported by a strong business case, a strategy of establishing a sustainable irrigation water source for resilience in the face of future droughts, a need to reduce odours, and motivation to reduce the logistics and cost of sewage removal and disposal.

Challenge

Warwick is a multi-award winning wine estate with a reputation for high quality wine tasting experiences. However, the growing number of wine tasting customers (average of 1000 people per day in peak summer season) was putting strain on the small and ineffective wastewater treatment plant, situated at the entrance to the estate. The state of the plant and several other septic tanks at staff houses around the farm required emptying increasingly frequently, causing additional financial and logistical burden.

Furthermore, Warwick was looking for a sustainable source of irrigation water to see them through future droughts, which pose the risk of poor quality harvests and associated reductions in their wine sales revenue.

Solution

A new 23 kl/d wastewater treatment plant and sewage collection system including pump stations were designed, installed and commissioned by Utico Water. The plant treats the domestic sewage from the wine tasting cellar and all on-site staff housing. The treatment process includes screening, a biological activated sludge reactor with membrane filtration, and disinfection. Waste sludge from the reactor is dewatered, composted and included in the garden's bedding material, only a wheelbarrow full per month in winter and up to two per week in peak summer season.

By including membrane separation technology, a General Authorisation[2] standard for effluent irrigation was easily achieved. The effluent flow is used for irrigation in the gardens, which at the time of publishing was an average of 10 kl/d. This additional water supply reduces the estate's reliance on rain and groundwater sources.

[1] Membrane biological reactor (MBR) is the combination of a membrane process like microfiltration or ultrafiltration with a biological wastewater treatment process.
[2] General Notice 665 of Gazette Number 36820 of 6 September 2013

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Business benefits

With an estimated 2.9-year payback period, relief from the logistical burden of sewage removal and disposal, reduced odours for customers, water resilience for sustainable irrigation of the effluent in future droughts, and reduced environmental impact from improved treatment processes, the new 23 kl/d MBR wastewater reuse plant was easy to justify. Average irrigation water savings of 10 kl/d are currently being achieved, and after the payback period, savings of at least R 31 350 per month in operation and maintenance costs are anticipated.

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Description	Value (Rand excl. VAT)
Estimated average wastewater removal and disposal costs (per month)	R 40 000
Capital cost of new plant (once off)	R 1 100 000
Operation and maintenance costs (per month)	R 7 000
Electricity costs (per month)	R 1 650
Payback period	2.9 years
Savings to be realised after payback period (per month)	R 31 350

Lessons learned and future plans

The feasibility of installing a wastewater reuse plant at Warwick Wine Estate was achieved through careful planning and selection of an appropriate solution to all of the challenges faced on-site. The growing popularity of the wine tasting venue alongside the aging of the existing wastewater treatment infrastructure culminated in an attractive business case for the upgrade. The project was easily approved by management due to the multifaceted benefits, from a short financial payback period and logistical burden relief to reduced odours for customers and water resilience for sustainable irrigation in future droughts. There are plans to extend the plant's treatment capacity to include the treatment of the winery wastewater in 2022.

For business support

1. **Visit our business drought support page for info on how to get started:** www.greencape.co.za/water-business-support
2. **Become a GreenCape member and receive industry updates, news and events info:** https://www.greencape.co.za/become-a-member/
3. **Access agricultural and agri-processing sector water efficiency resource and resilience guidelines:** https://www.greenagri.org.za/tips-and-tools/water-management/

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