WATER RECYCLING CASE STUDY

The Wolgan Valley Resort and Spa, NSW, Australia

Located adjacent to the greater Blue Mountains World Heritage Area, Wolgan Valley Resort & Spa is a conservation-based resort bordered by two National Parks. The homestead-style resort is set within its own private conservation and wildlife reserve. The resort occupies less than 3 percent of the 4,000 acres it sits on, with accommodation comprising 40 free-standing suites, each with private deck and their own pool.

A world-class conservation resort needs a world-class wastewater system, so it was no surprise when the Orenco technology was specified as the front-end to a high quality solution to meet the environmental needs of the development. As well as equipment specification, Innoflow were also awarded the supply & supervision contract for the construction of the entire wastewater treatment system. Part of this supervision included the carrying out of rigorous process proving and performance validation for the plant.

Figure 1. The pristine site of the Wolgan Valley Resort & Spa

The wastewater management system for the resort is designed to treat an average flow of 108,000 litres per day with peaks of up to 135,000 litres. The plant comprises three main treatment processes; primary treatment, secondary treatment and tertiary disinfection. The 'High Risk Exposure' effluent (as per NSW Health Guidelines) will be utilised to irrigate pasture and key garden areas and pasture areas in the resort.

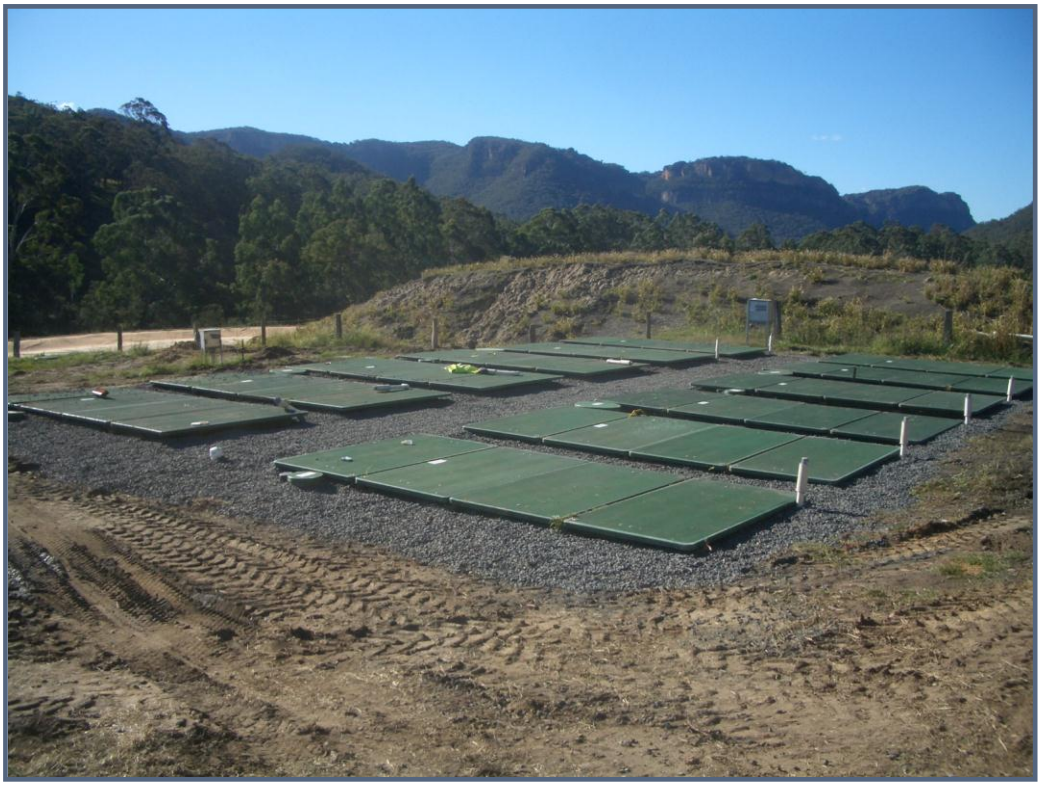

Figure 2. The AdvanTex Treatment system following backfilling

Prominent's Dulcodes 'D' UV system provides stage-1 disinfection to the effluent before storage in the Irrigation Supply tank

Table 1. Treatment System Design Performance

Parameter	Required Value	Performance
BOD_5	<10 mg/ltr	3.3 mg/ltr
Suspended Solids	<10 mg/ltr	1.5 mg/ltr
Faecal Coliforms	<1/100ml	<1/100ml
Total Nitrogen	<15 mg/ltr	13.2 mg/ltr
Total Phosphorus	<10 mg/ltr	3.9 mg/ltr
Pathogens	<1/100ml	<1/100ml,

**Effluent quality results show actual system performance during the 3-month process proving period January – April 2010.*

Figure 3. The first banks of AX PODs during commissioning

As with all Innoflow's treatment systems, the solution for the Wolgan Valley Resort & Spa is very low in terms of impact.

The low-profile treatment plant, which generates very little odour and minimal noise, sits almost 'unnoticed' beyond the Staff housing precinct.

The low-energy AdvanTex PBR, coupled with multi-media filtration, UV disinfection and residual chlorine dosing ensures the resort has a constant, year-round source of irrigation water for key areas in the grounds, including pasture sites and villa gardens

Figure 4. The Multi-media filtration plant

Table 3. System Summary

System Component	Specification	Comment
Design Flow	135,000 litres per day	Peak wastewater flow, expected during high-season at the site
Primary Treatment System	360,000 litres	Consists of 3 tanks connected in series to act as one large enhanced septic tank
Recirculation Tank Size	120,000 litres	Cast insitu concrete tank, fitted with Orenco's proprietary ProSTEP™ Pumping system
Recirculation Pump	8 x Multi-stage turbine (4")	4 pumpsets with DAX control to provide inherent redundancy
Packed Bed Reactor Area	144 m^2	This process ensures NO odour production from the treatment plant
Transfer Tank	50,000 litres	All underground
Disinfection System	Multi-media filtration, primary UV, secondary chlorine dosing	All instruments connected to Innoflow's control system, which also interacts with overall resort BMS

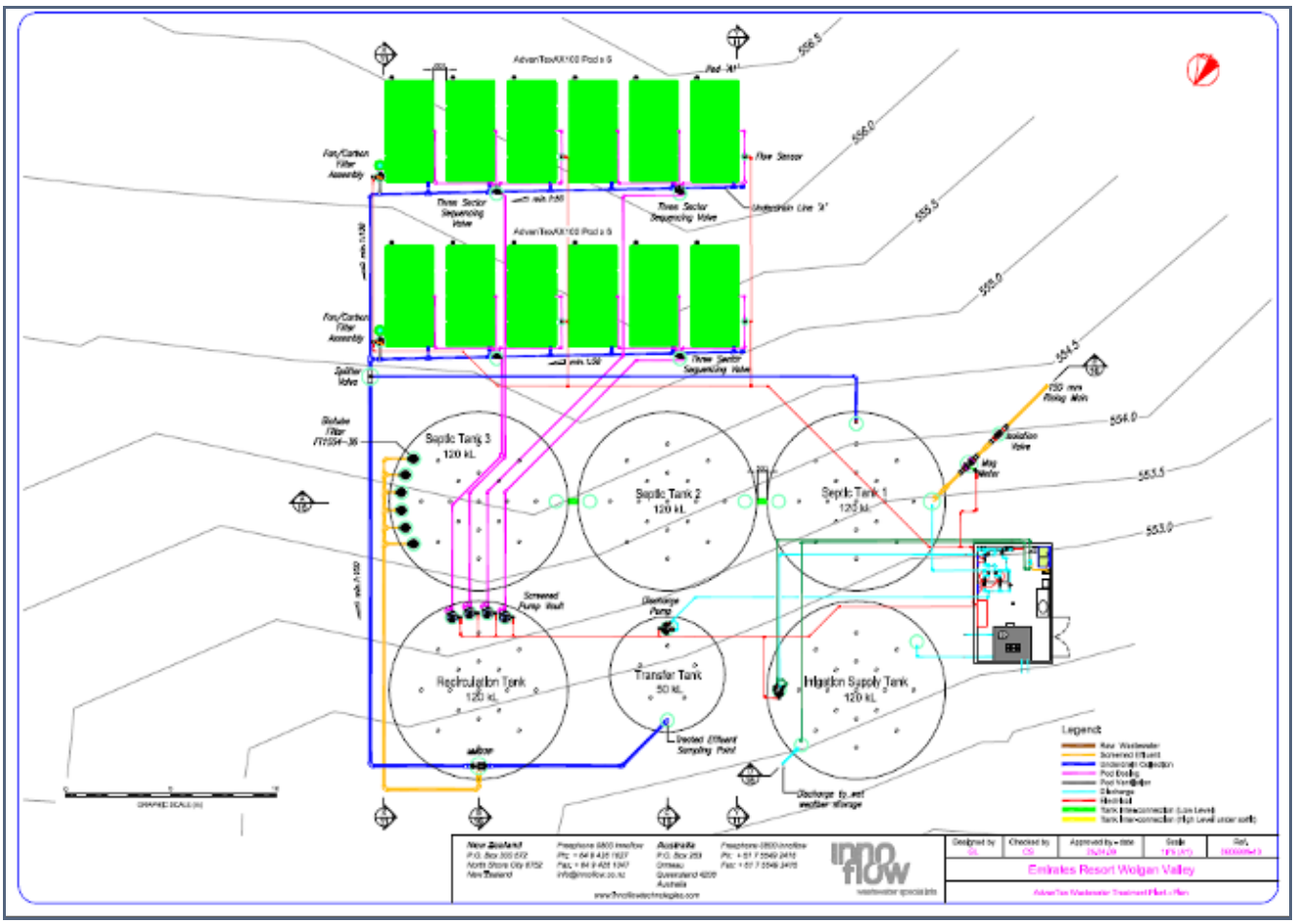

Figure 5. Plan view of the Wolgan Valley Resort & Spa wastewater treatment plant