INNOFLOW TECHNOLOGIES
INNOVATIVE WASTEWATER MANAGEMENT

WASTEWATER MANAGEMENT - CASE STUDY

Crusoe's Retreat, Coral Coast, Fiji

Fiji's lagoons and coral reefs are suffering after years of tourism and development in the area. Excess nutrients are ruining the ecosystem, and as a result, scientists at NIWA, in conjunction with the University of the South Pacific, are trialling the AdvanTex™ wastewater management system at Crusoe's Resort in an attempt to reduce the effects of effluent disposal on the environment. If all goes well, the AdvanTex™ system will be actively promoted throughout the South Pacific, and the possibilities for future development are endless.

Recirculating textile Packed Bed Reactors (rtPBRs) were chosen for their superior performance. They also have a proven track record in treating variable flows (such as those experienced at a resort) reliably. The in-built emergency storage and safety measures mean that it is virtually impossible for untreated effluent to enter the environment.

Figure 1. Crusoe's Retreat – Marketed as "Fiji's best kept secret".

The system is an AdvanTex™ AX100, servicing 13 Bures at the coral coast resort. Installation of the system and construction of all tank work was completed by local workers, under the supervision of staff from *Innoflow Technologies NZ Ltd*. The elegant simplicity of the AdvanTex™ technology meant that training local staff to install the system was straightforward; this was important as widespread uptake of the technology will largely depend on the ability of local staff to install the systems and assume the responsibility for day-to-day running of the plant. The system re-used the existing septic tanks (after thorough investigation to ensure suitability), with two lower tanks feeding to a new pumped tank. Tanks were fitted with Biotube® Effluent Filters to improve efficiency.

Table 1. Design Constraints

Constraint	Solution	Comment
Limited area for treatment plant	Utilise very small footprint of the Textile rPBR	Minimising the area taken up by the treatment plant means more space for bures and therefore greater returns for the resort
Remote location, limited transport options	AdvanTex™ Textile Pods did not present a problem to transport	The rtPBR process also has very low biosolids production meaning reduced costs for removal off site
Highly seasonal usage	Use rtPBR process designed for peak loading	The rtPBR process has a 100% turn-down ratio providing consistent performance under fluctuating loads
Remote location, limited onsite technical support	Installation by local staff under supervision to aide in understanding of system	Use of AX100 rather than several smaller pods added to simplicity – one input, one output

Figure 2. A co-operative relationship between local installers and trained Innoflow staff resulted in the project proceeding smoothly.

Table 2. Treatment System Performance

Parameter	Expected Performance
BOD_5	<15 mg/ltr
Suspended Solids	< 15 mg/ltr

Treatment plant performance will be closely monitored by the University of the South Pacific

Figure 3. Installing the tanks.

Local installers constructed the tanks and installed the AdvanTex™ system, under the supervision of Innoflow staff.

The tanks were constructed using local methods, and therefore it was important to ensure these tanks were watertight before use.

Using local methods meant that the learning curve for local installers was not as steep, limiting any future difficulties due to lack of technical understanding.

This will also prove useful if the technology is used widely in the islands.

Although the AdvanTex™ system is usually installed below ground, the site constraints in this location did not allow for burying the treatment plant.

It was not a problem to install the plant above ground; performance will not be affected and the underlying coral will stay intact.

Figure 4. The rtPBR pod.

Table 3. System Summary

System Component	Specification	Comment
Design Flow (Peak)	7 m^3/day	13 two-person bures; larger allowance due to increased water consumption in resorts (longer showers etc)
Primary and Transfer Tanks	Existing	By others
Pump Station	7 m^3	To collect wastewater from lower tanks and transport up to treatment plant
Recirculation Tank Size	7 m^3	Local construction
Recirculation Pump	1 x High Head Turbine (5")	At peak – 2.1 hours run time per day @ 0.75 kW per pump
Packed Bed Reactor Area	12m^2	Installed above ground

Due to the close proximity to bures, size and layout of the treatment system were important. The small footprint of the rtPBR meant installation within the available area was not a problem.

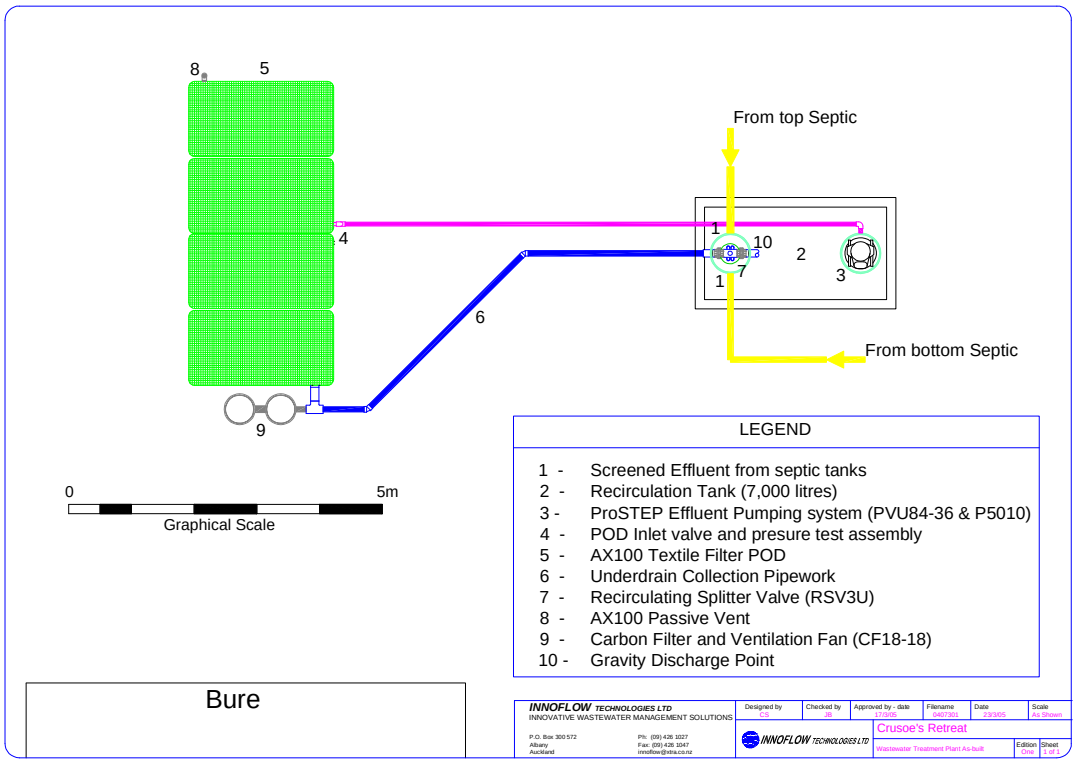

Figure 5. Schematic as built of the wastewater treatment system.