



# **Wastewater Management Demonstration at Crusoe's Retreat, Coral Coast, Fiji Report on the Demonstration and Observations 21 April 2005**

**Tasleem Hasan**  
*SOPAC/USP Water Quality Officer*

## **SOPAC Trip Report 374**

### **INTRODUCTION**

The wastewater management demonstration was part of the Integrated Coast Management (ICM) project which is coordinated by the Institute of Applied Sciences (IAS), USP with support from the Coastal Resources Centre (CRC), University of Rhode Island and the Government of the Fiji. The main focus of this project was to identify solutions for coastal waste management in order to reduce the algal bloom observed around coastal areas in Fiji. Some of the already on-going projects identified were the Wetland at Tagage Village, Komave Village composting toilets and the waste management work done by International Waters Programme (IWP) in Rewa Delta.

Crusoe's Retreat Resort was chosen as the pilot area to set up a secondary waste treatment system after consultation with experts from New Zealand and United States. A good thing was that the resort offered to cater for all the costs of setting up such a system. Innoflow Technologies Limited was then contacted as they deal with installation of simple and effective secondary waste treatment systems. The main contact person was Chris Shortt<sup>1</sup> and he supervised the installation and completion of the system.

### **DEMONSTRATION**

Chris Shortt explained that the system basically consisted of three major phases.

1. Primary treatment – takes place inside septic tanks (already existing ones and a new one built). These were modified slightly by installing a filter at the outlet so that big solid matter (>3mm) do not pass through and move to the next phase.
2. Secondary treatment – the wastewater from the septic tank gets filtered again in a small chamber and moves to a large tank for treatment. In this tank are specially designed filters which are used instead of the traditional sand filters. Its advantage is that it is more efficient for microbial growth and it will last a life time if properly maintained. The wastewater is recirculated four times through the filters before they move to the final phase.
3. Disposal – the treated waste is disposed to gardens for nutrient uptake by plants.

Note: A schematic diagram of the wastewater treatment system is on page 4 of the handbook provided by Chris, see Attachment.

## COMMENTS

The main processes in a wastewater treatment system are nitrification and denitrification. Basically, the ammonia in waste is converted to nitrate (nitrification) and then the nitrate is changed to nitrogen gas (denitrification). When wastewater is not properly treated, a lot of nitrate is discharged into the sea and other water bodies like rivers and streams leading to algae problems. This treatment system set up at Crusoe's changes about 75% of nitrate to nitrogen gas and about 15% is assumed as going to be taken up by the plants. Hence only 10% would be going out to the sea which will really help keep the reef ecosystem healthy.

Currently, the system is designed to treat only wastewater but if grease traps are installed then it can be used for domestic wastewater as well, provided no harsh disinfectant is used which could kill the bacteria needed for digestion of the waste.

The overall cost of setting up this secondary wastewater treatment system at Crusoe's was about FJD 60,000.00 and it has the capability to serve about 15-20 bure units which house about 45-60 people at the resort.

## FOLLOW UP

A MSc student from IAS (USP), Mr Exsley Taloiburi, is going to monitor the quality of water for parameters such as nitrate, nitrite, ammonia, total nitrogen, phosphorous, total phosphorous, faecal coliforms and total suspended solids. He is going to test the untreated wastewater and the treated wastewater to check the efficiency of the treatment. He is also going to analyze samples from the sea to check if the quality of the environment is improving by the installation of this new technology.

## GENERAL

Professor Bill Aalbersberg mentioned that the Environment Management Bill has become an act now. The key thing is that it is based on a permitting system that is any facility that discharges waste is issued with a permit and then they will have to follow certain regulations and meet set standards before dumping their effluent into the environment.

## OBSERVERS PARTICIPATED FROM –

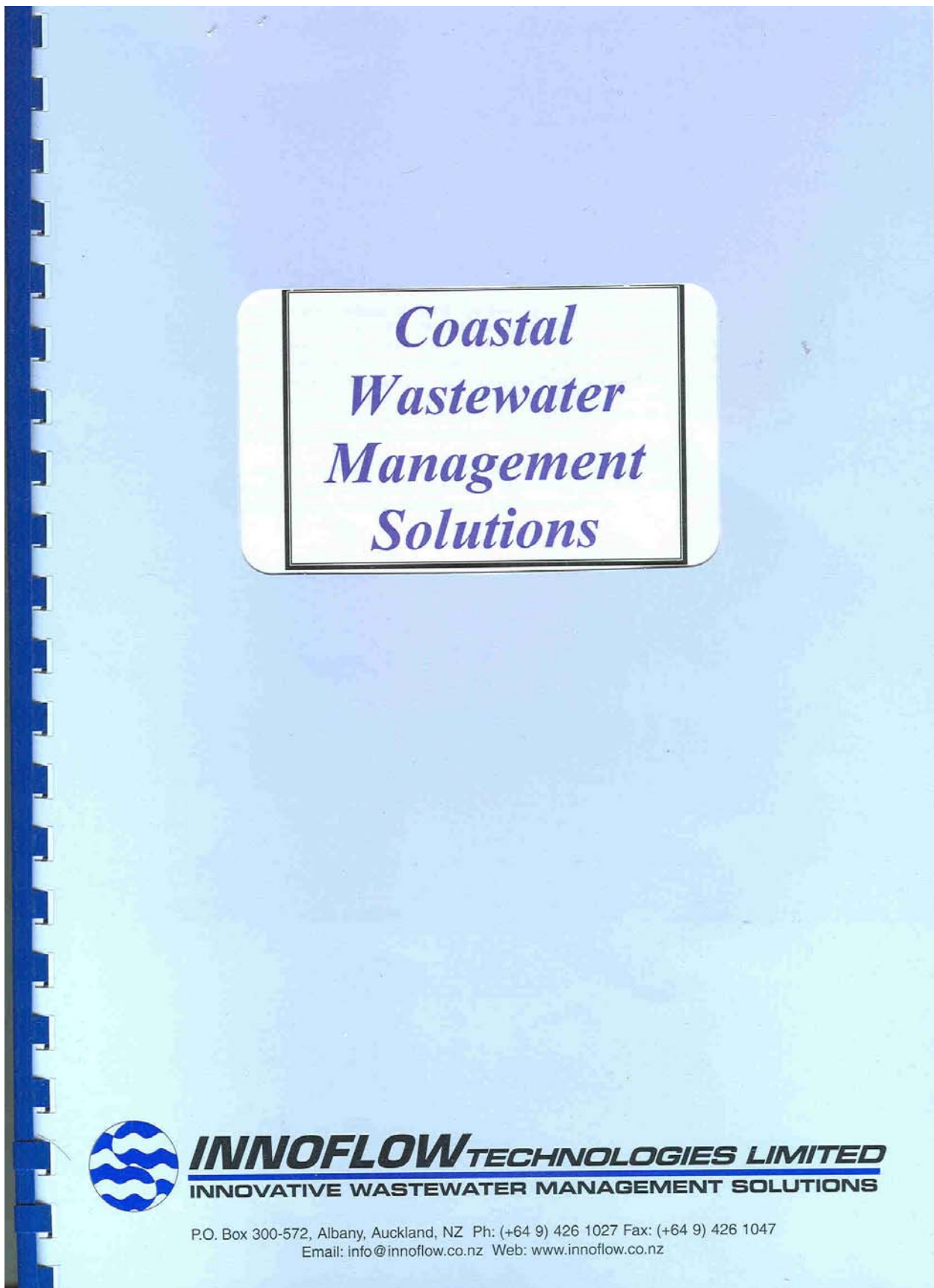
Ministry of Health, Department of Environment, JICA, IWP, IAS, WHO, Warwick Resort, Hideaway Resort, Komave Village, Macuata

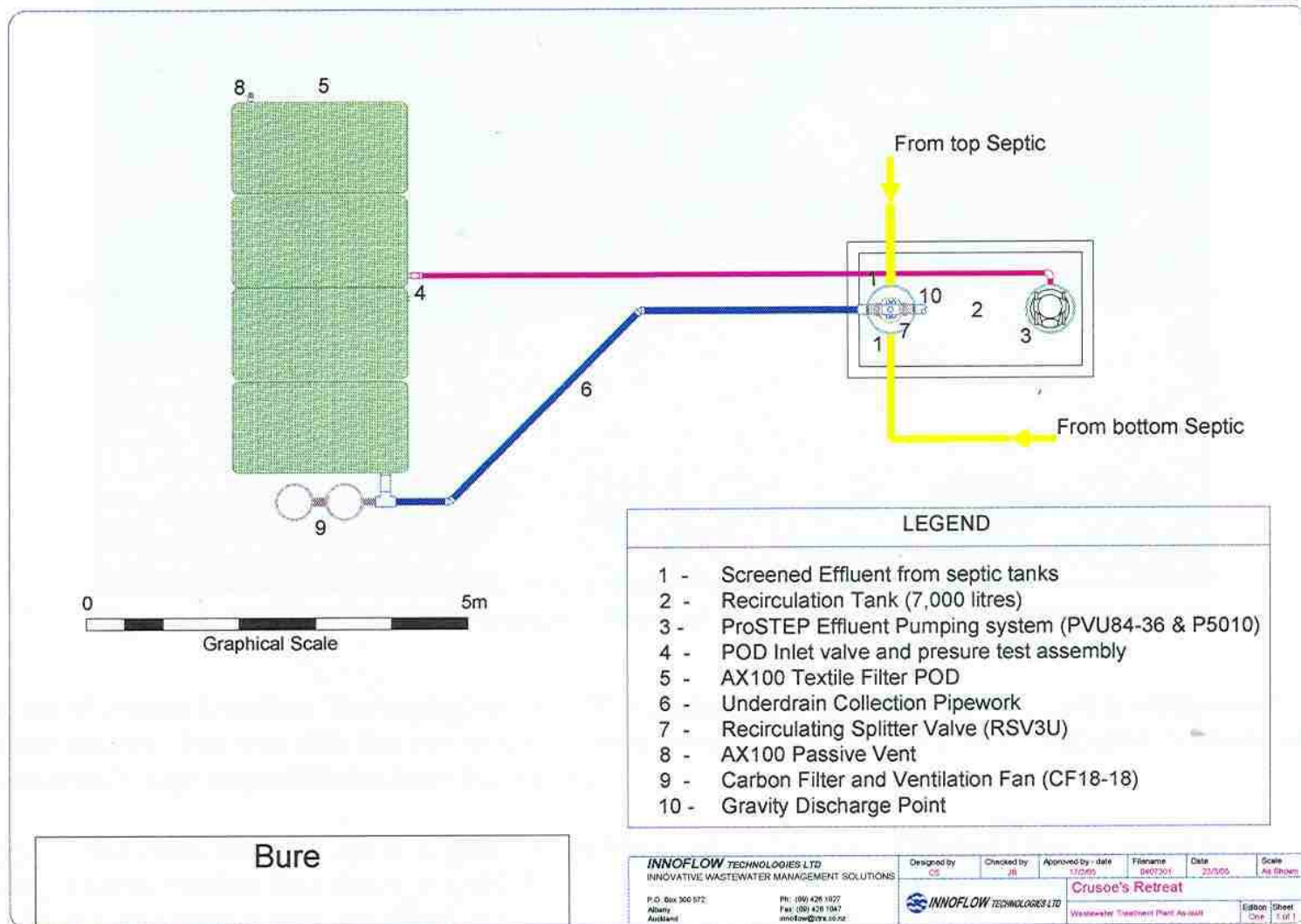
1. Chris Shirtt (BE)  
System Supporter Engineer  
P.O. Box 300-572, Albany  
311A Postman Rd, Dairy Flat  
Auckland, NZ  
Phone: 09-426 1027  
Fax: 09-426 1047

E-mail: [innoflow@xtra.co.nz](mailto:innoflow@xtra.co.nz)

ATTACHMENT

- 1) Cover of Innoflow Technologies Limited Coastal Wastewater Management Solutions Handbook
- 2) Schematic of wastewater treatment system





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