

# FIRST OF ITS KIND WYANGALA STP

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## **ABSTRACT**

### **Objective**

To replace the out dated infrastructure which was not suitable for upgrade with a new modern plant to meet current Waste Water Treatment requirements from both the Village of Wyangala and Wyangala Waters State Park (WWSP) and be able to deal with variations in the types and amounts of inflows during off peak and peak loadings periods.

### **Old Plant**

The village of Wyangala had a series of septic tanks that ran to an effluent trickle filter plant. Wyangala Waters State Park septic system pumped up to an effluent transpiration pond.

### **New Plant**

The village of Wyangala is now serviced by a conventional gravity sewerage system. This collects the sewage from all areas of the village which then flows into a pump station that has a duty standby system. Sewage is pumped approx 1.2 km to the inlet works at Wyangala Sewerage Treatment Plant (STP).

Septic Tank effluent from the Wyangala Waters State Park is pumped from their station to the inlet works at the Wyangala STP. This flow can be directed to either the IDEA or Pre Treatment Reactor (PTR) tank depending on volume of flow.

### **Contributors**

Public Works: Design, DPIE: Funding and Process and Gongues: Construction  
Cowra Shire Council: Commissioning and Operations

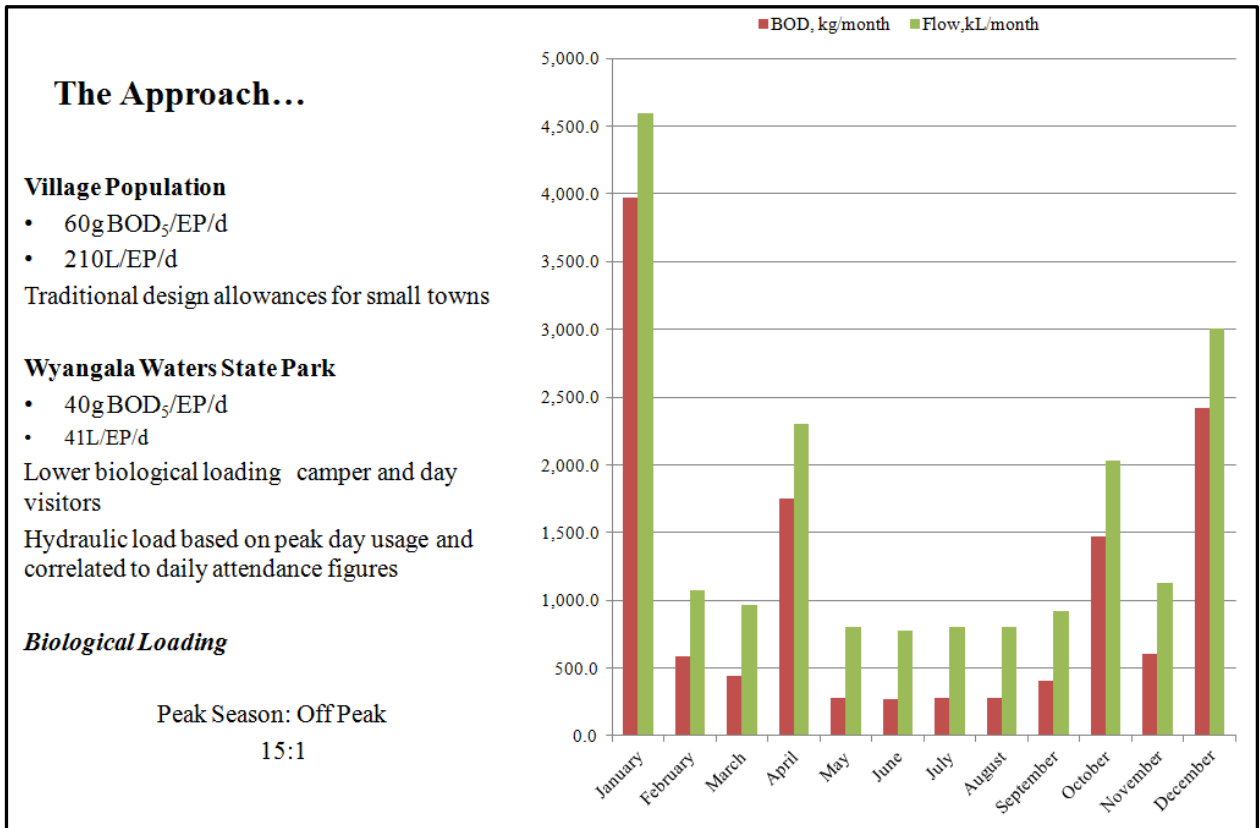
## **1.0 INTRODUCTION**

### **Old Plant a Trickle Filter System**

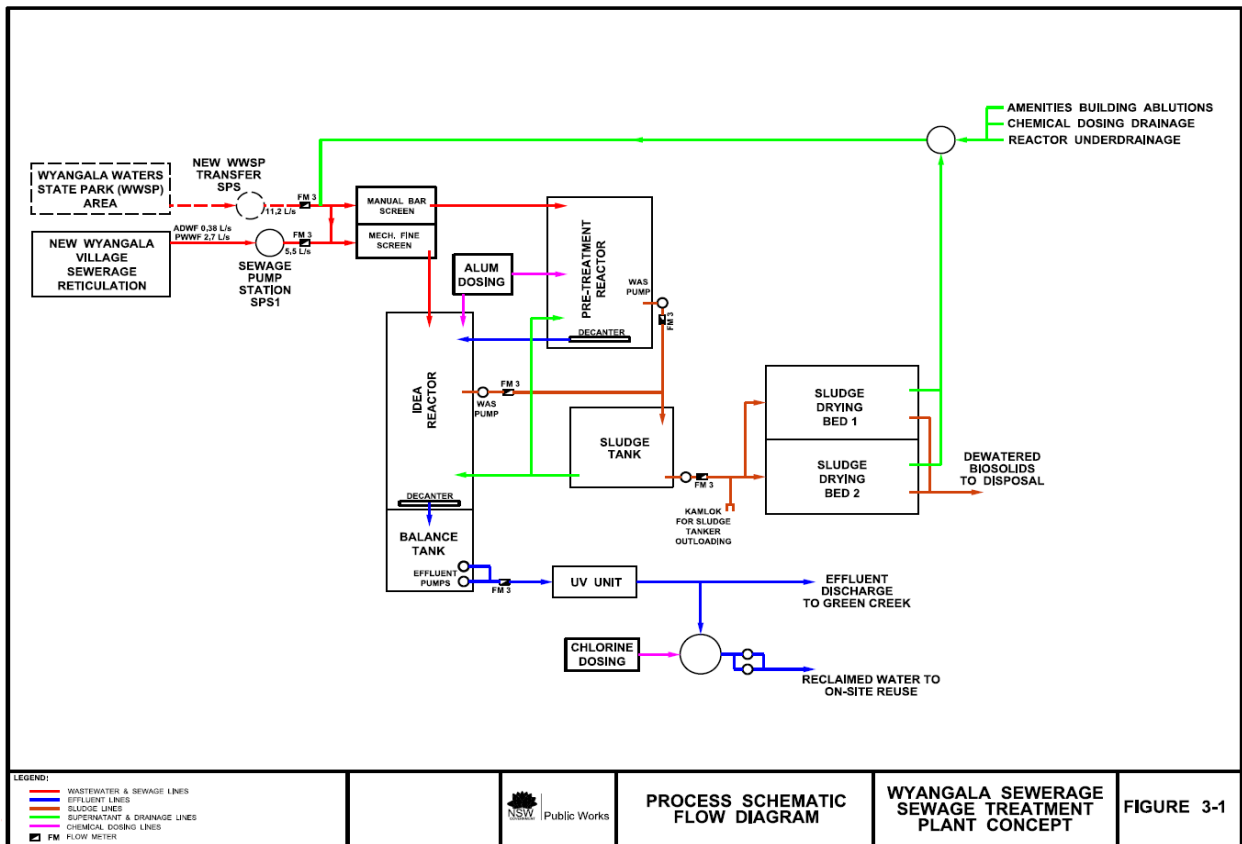
Poor condition, undersized, seasonal discharge of poor quality effluent, leaks, odours, not suitable for any upgrade, flood risk, and no emergency storage

### **Wyangala Waters State Park (WWSP)**

Servicing, park amenities building subject to overloading at peak times, seasonal pump out required, and some soil absorption trenches



**Figure 1:**



**Figure 2:** System flow diagram  
2.0 NEW PLANT DESIGN AND CHARACTERISTICS

This has been designed to remove the old septic tanks and the Wyangala Waters State Park transpiration pond and bring sewage into an Intermittently Decanted Extended Aeration (IDEA) system for Average Dry Weather Flow (ADWF) Estimated Population (EP) of 170. Pre-treatment reactor peak flows over holidays is EP 5000.

- Wyangala village sewage pumping station.
- Inlet works comprising an inlet receivable structure, spiral sieve mechanically raked screen with bypass channel fitted with manually cleaned bar screen, flow measurement unit and flow distribution structure. It can accommodate maximum inflows of up to 13.9 L/s;
- A pre-treatment reactor to undertake pre-treatment of sewage from WWSP to lower ammonia and total nitrogen, then the effluent is discharged to the IDEA;
- An Intermittently Decanted Extended Aeration (IDEA) tank for biological oxidation, nitrification and de-nitrification of the wastewater with associated aeration, effluent decanting and waste activated sludge (WAS) pumping equipment;
- An alum dosing system for chemical phosphorus removal;
- UV disinfection system to sterilize catch balance tank effluent up to 3 x ADWF prior to on-site reuse and off-site discharge (Creek discharge);
- On-site pressurised effluent reuse system;
- Sludge tank for stabilisation treatment, thickening and storage of waste sludge;
- Sludge drying bed for dewatering stabilised sludge
- Site works including amenities building, site drainage and lighting

### **3.0 ISSUES and SOLUTIONS**

- Upgrading of power lines and easements through properties, delay in the ordering and delivery of the new transformer.

Wait for other parties to resolve issues for power supply.

- Wyangala Waters State Park has low Biological Oxygen Demand (BOD).

Supplementary carbon dosing Sucrose 400ml/hr from 18.00-06.00 dosing was implemented to increase BOD during low flows.

- PTR decanting at the same time as the IDEA decant creating short circuit.

Re programming of the PTR sequence so it would decant while the IDEA was aerating.

- The WWSP pump station ran once a day resulting in slug dosing into the plant.

Liaised with the Wyangala Water State Park operations to have them pump their effluent at more regular intervals rather than once a day. With more frequent pumping the plant received regular loading throughout the day.

- The Village pump only ran 3 times per day thus giving us slug dosing and septic sewer.

Adjusted levels at the village P/S to 7 pump runs in a 24 hour period.

- During commissioning of the Village pump station there was ingress of sand resulting in wear of impellers and the pump casings which shortened the life span of both pumps.

We used a vacuum truck to clean out the sewer wet well and installed new pumps. Possibly caused by poor initial cleaning of new mains.

- Both ejectors running during low temperatures at night causing low temperatures in the IDEA.

Turned both ejectors off and only ran mixers reducing cold air induction.

- UV system not communicating with SCADA system.

Sorted out the communications issues between the two systems.

- Trouble with remote communications and control.

Currently using a dongle and hoping to bring communication through the new digital radio network.

- High flows and using the PTR. As this holiday season 2019/2020 was the first time we have used the PTR we found that the decant speed and High Water Level (HWL) were a major factor in the operation. Due to the Bottom Water Level (BWL) being set at 1.96m and the HWL was up to 2.8m the decant was going down to the BWL at the slow rate which created a high velocity flow and carry over.

We have now added a program that allows us to manually decant if needed to reduce the velocity of the clear liquor being removed and hope in the future to implement a slower decant rate to reduce velocity.

- The original placement of the Dissolved Oxygen (DO) probes 1 of which was in a dead zone of IDEA and not giving a true reading.

The DO probe has been moved to a more central location thus giving better results and more uniformity.

#### **4.0 CONCLUSION**

With all the changes that have been made to the process we are now getting good results with our ADWF but peak loading will continue to be troublesome. Peak demands are only during the holidays and long weekends and vary depending on the weather and dam levels, which affect park attendance. Current trials have been at about 50% of peak so it could be sometime before we get this process right.

The new Wyangala STP has created a lot of challenges for our operators many of which are new to waste water treatment system. With having the support of management and staff it has made the process not to difficult.

This new plant will be a work in progress for a while we are looking forward to the challenges ahead to cope with peak loads.

#### **5.0 ACKNOWLEDGEMENTS**

I would like to thank Chris Carlon and the engineers from DPIE, our management Dirk Wymer, Mick Tedeschi, Peter Ford, Tim Long, Supervisor Paul Gregg and the operations staff for their knowledge and assistance throughout the commissioning of the plant and into the future.