

# Flocculation Facts



## Flocculation

### How to get the best out of your floc shed

This fact sheet has been prepared to provide industry with a best practice guidance to ensure optimum performance of a rainfall driven polyaluminium chloride (PAC) dosing system

The use of chemical treatment should not be regarded as a substitute for good site management, to minimise the erosion and transport of sediment by stormwater, or optimised design and maintenance of sediment retention ponds.

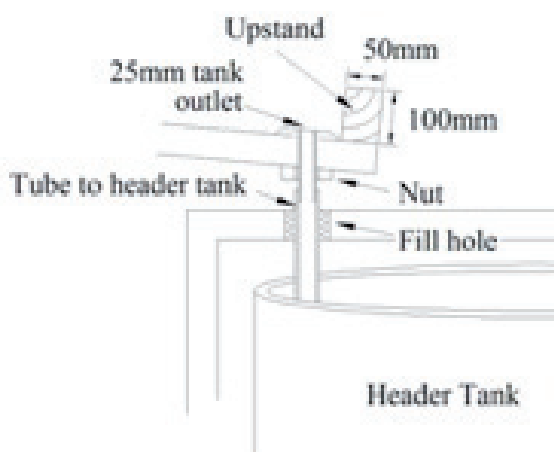
Rainfall activated chemical treatment is proven effective but a number of problems have contributed to the reduced performance of dosing systems. These can be easily addressed and the following provides guidance.

### Rainfall Catchment Trays

#### **Problem - Leaks between tray and upstand**

The rainfall catchment tray is normally constructed of plywood with a 100x50mm upstand around the edge. Initial construction of the rainfall catchment tray is often poor with no adhesive between the tray and the upstand, and/or insufficient screws or nails between the tray and the upstand to achieve a tight joint.

**Solution - Ensure a watertight seal is achieved between the tray and the upstand by using a suitable adhesive during construction, and providing a strong mechanical joint such as screws.**



**Figure (c) Horizontally Outlet From Rainfall Tray**

#### **Problem - Leaks around the outlet**

The outlet is commonly constructed from 20 mm rigid pvc tube which passes horizontally through the low end of the upstand and into a tube that delivers the water to the header tank. It is difficult to construct a strong mechanical joint between the tube and the upstand as the invert of the tube needs to be at the level of the face of the tray.

**Solution -** Wherever possible use a 25 mm tank outlet to make a vertical outlet from the low point of the tray. The tank outlet is provided with flanges and seals and can be screwed tightly to the tray giving a watertight seal (Refer Figure C).

If a vertical outlet is not practical a 25mm tank outlet could be placed horizontally at the outlet end of the tray. Otherwise use a horizontal outlet made of 20 mm rigid pvc tube through a hole drilled in the upstand to provide a tight fit. Seal the outlet as it is fitted.

#### **Problem - Blockage of tube between tray and header tank**

The 20mm tube between the tray and the header tank can become blocked as a result of the accumulation of debris washed off the tray.

**Solution -** During periods without rain the tube should be checked, at least every fortnight, by pouring water onto the tray and checking the flow. Alternatively a wire mesh screen with an aperture of about 5 mm could be installed around the outlet.



**Figure (d) Header Tank Outlet**



#### **Problem - Shed and tray not installed level, leading to loss of collected water**

If a large tray is not very close to level at the lower end there is a possibility of loss of water over one corner of the tray.

**Solution -** Install the shed level, and check that the tray is level across the lower end. Construct the upstand of the lower end of the tray in a shallow V from the sides of the tray to the centre of the lower edge to direct the rainwater to the outlet.

### **Header/ Displacement and Chemical Reservoir Tanks**

**Problem - Leaks in seals of tank outlet fittings and hose connections**  
Leaks in seals of tank outlet fittings and hose connections occur quite commonly, particularly after a treatment system has been relocated to a different pond.

**Solution -** Routine fortnightly inspections to check that the fittings are tight and that there are no leaks, and additional inspection following relocation of a treatment system, or temporary movement of the chemical delivery tube.

#### **Problem - Crimping of outlet hoses**

Plastic garden hoses often crimp (fold) especially during hot weather where the hose turns through a 90 degree angle to fall into the displacement tank.

**Solution - Either a non crimping hose should be used or a high tensile wire reinforcement taped to the hose provided to prevent crimping (refer Figure D on the previous page).**

#### **Problem - Leaks in reservoir tank outlet seals and attachment to dosing tube**

Reservoir tank outlets and the joining system to the chemical delivery tube occasionally work loose, particularly when the chemical delivery tube has been moved for construction purposes and too much lateral pressure placed on the joint, and also after moving and reassembling a treatment system.

**Solution - Routine fortnightly checking of the reservoir tank outlet fitting and joints should be undertaken, with additional checks after the delivery tube has been temporarily moved, or the treatment system has been moved.**



#### **Problem - Orientation of chemical delivery tube**

The orientation of the chemical delivery tube at the discharge point is important. If the chemical delivery tube is oriented into the stormwater flow it is possible for the stormwater flow to cause pressure at the tube outlet and reduce the discharge of chemical.

**Solution - Avoid orienting the chemical delivery tube so that the end of the tube is directed into the stormwater flow. A 90 degree bend should be fitted to the end of the chemical delivery tube with the open end directed downwards.**

#### **Problem - Maintenance of Displacement Tank**

As the displacement tank is filled the capacity to treat future stormwater flows is reduced. If the displacement tank is filled to the level at which it sinks onto the bottom of the chemical reservoir tank then dosing will cease. Failure to empty the displacement tank (and refill the chemical reservoir tank) can result in PAC dosing stopping part way through a storm.

**Solution - It is recommended that the minimum treatment capacity should be 100 mm of rainfall. Thus if a tank system had the capacity to treat a rainstorm of 200 mm the maximum depth allowed in the displacement tank would be greater than that allowed for a system with the capacity to treat a rainstorm of 120 mm.**

**The PAC dosing system should be inspected after every rainstorm and periodically during showery weather to ensure that the minimum treatment capacity is maintained.**

### **Chemical Delivery**

#### **Problem - Leaks in chemical delivery tube joints**

The chemical delivery tube between the reservoir tank and the dosing point is made out of 20 mm rigid pvc which is supplied in 6m lengths. Separation of sections of the chemical delivery tube and leaks in loose joints result in a loss of chemical prior to the dosing point.

**Solution - All joints in the chemical delivery tube should be glued with solvent cement.**

#### **Problem - Height of chemical dosing point.**

Occasionally the dosing tube has been installed too far above the bed of the stormwater channel, with the result that strong wind can move the chemical flow out of the stormwater channel.

**Solution - The end of the dosing tube should be located no more the 200 mm above the bed of the channel and anchored securely to prevent it being washed away during high flow periods.**