

Enhancing an Anaerobic Process



Why was it so?

Construction documentation indicated recirculation flows were designed to be drawn from one end of the launders, and discharge flows from the opposite end.

Post construction, it became apparent that whatever volumes came in to the Launders went out, bypassing the recirculation pump well.

This meant that the volumes which should be going to recirculation were being released to the down-stream aerated lagoon.

How do we fix this?

We needed to restrict the discharge flows so that more effluent was available for recirculation.

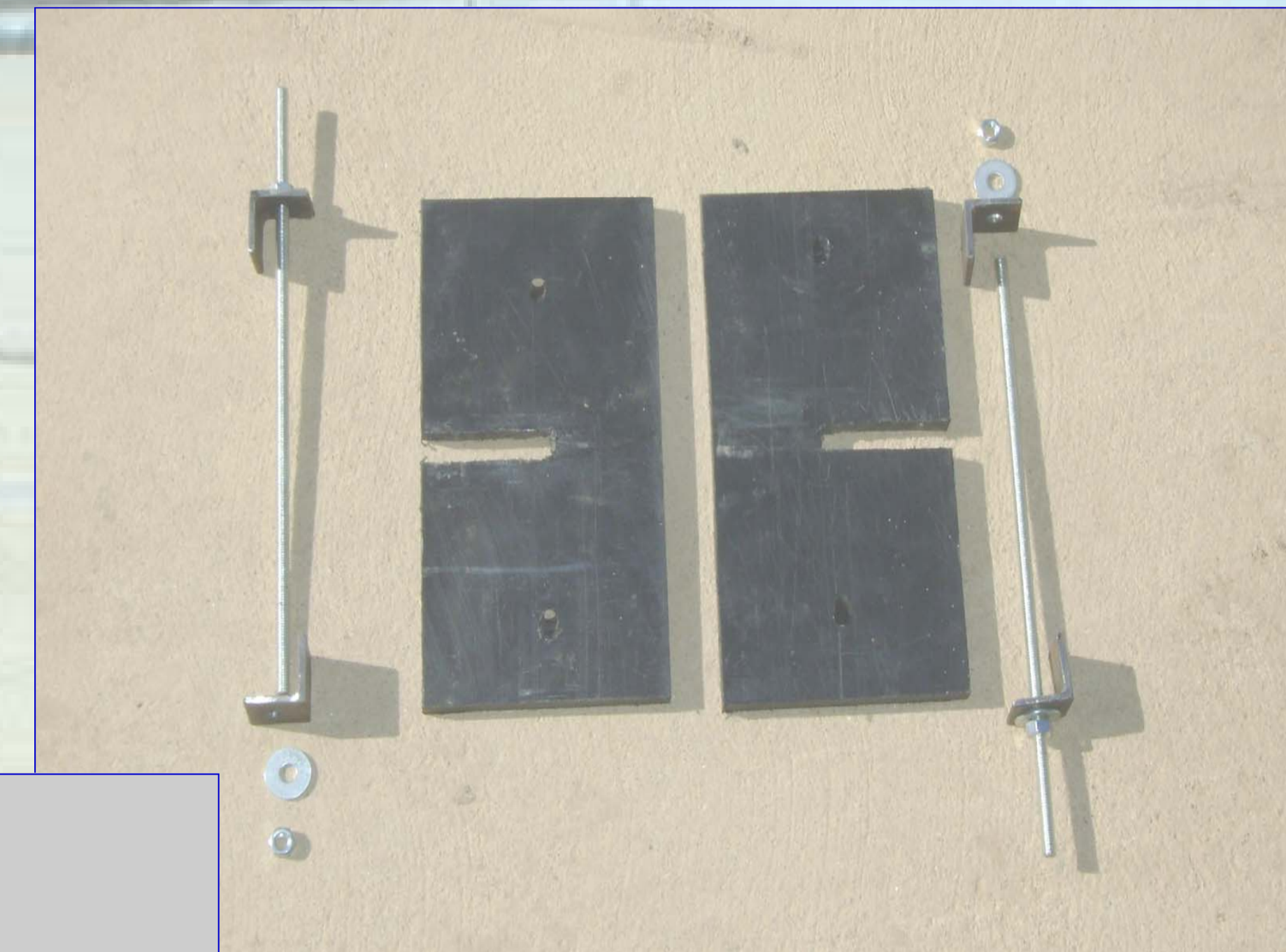
The best method was to install a weir so that launders remained full and maintained a volume to be recirculated. Inflows in excess of recirculation needs would then pass over the weir.

Installing a Weir within an Explosive Environment:

After careful measurement a weir was designed and assembled from High Density Polyethylene (HDPE).

Two slotted rectangular pieces were fitted together to form a cross. The centre of this cross was equidistant from the four cross arm extremities 10mm Stainless Steel all-thread rods were inserted through the wings of each side.

The Weir was “persuaded” into place within the launder walls with a crowbar. The nuts on the all-thread were then tensioned to ensure a snug fit.



Background:

The Mooroopna “High Rate Anaerobic Lagoon” (HRAL) treats industrial and domestic wastewater from the township.

The purpose built 60ML lagoon uses anaerobic processes to convert carbon in the wastewater to methane and carbon dioxide in a zero oxygen environment.

The HRAL has a floating polypropylene cover to capture the gases produced by the biological process.

Integral to the treatment process are recirculated flows extracted from launders situated along either side of the reactor. These volumes are used to enhance the mixing interface with incoming raw flows.

Problem:

Periodically the volume of partially treated wastewater available for harvest from within the launders became considerably reduced. Consequently, the recirculation pumps would run dry during these low inflow periods.

Outcome:

- With this modification in place, the recirculation pumps are able to pump at full capacity—13ML per day.
- This increased interface of raw influent and the recirculated effluent stream has increased the overall COD reduction within the HRAL.
- Increased inflows into the recirculation pump well have enabled our group to retro fit a 2.5ML per day mixing scheme to mobilise pockets of biomass beneath the cover.

Conclusion:

The installation of this simple but well thought out device solved the problem of no recirculation at low flows.

An expensive refit that would have necessitated removal of the floating cover and taking the HRAL off-line was avoided by a little operator ingenuity.