

Three-in-one water intake and water mixing structures – eliminating the need for two separate water towers and a separate mixing facility

Miners can now save costs and meet Environmental Protection Authority (EPA) requirements for the dilution of 'dirty' mine water prior to discharging to natural water ways

Coal miners usually construct earth dams to store water for processing coal and to store clean water for the purpose of dilution. The processing water is usually too salty or 'dirty' to be discharged directly into the natural water ways and so requires dilution with clean water to lower the concentrations of dissolved minerals to meet regulatory limits.

Typically this process requires an intake tower in each of the dams and the water is directed to a purpose-built mixing facility.

Cost saving solution delivered through innovation

We recently designed a twin-cell earth dam with a common embankment wall to separate the clean water from the dirty water for a coal mine in Queensland.

Embedded within the common embankment wall is an innovatively designed three-in-one reinforced concrete structure. This structure comprises three chambers. One chamber holds the clean water, and another the dirty water. These waters are then discharged into a third chamber - the central mixing chamber. The rate of water intake is controlled via sluice gates.



A three-stage mixing process

The primary mixing occurs in the central chamber and the secondary mixing occurs via a hydraulic jump just beyond the discharge outlet.

Mixing finally occurs by turbulent flow over a rock filled channel that ultimately flows into a nearby creek.

We customised a solution that would realise our client's objectives

We worked very closely with our client from Day 1 to understand their challenges.

We developed a number of alternate solutions and together we workshopped through the options. It was during this process that we developed a unique and customised solution which would meet their needs.

Not only did we tick all the boxes from the client's perspective, we gave them an innovative solution which effectively stripped out excessive costs. We were able to reduce the construction time as compared to the construction of conventional intake towers and mixing facility.

If you'd like to learn how we can help you resolve your engineering challenges, please contact Beng Cheah on +61 7 3608 2500 or by email at Beng.Cheah@coffey.com.

