



Large-scale In-situ Water Treatment Services

Directly dosing a waterbody with neutralising or other agents — a technique known as in-situ treatment — can often be more cost-effective and faster than conventional water treatment strategies such as centralised water treatment plants. Earth Systems has a range of cost-effective technologies and the expertise to design and implement large-scale in-situ treatment systems for impacted water bodies.

Large water bodies such as mine pit lakes affected by acid and metalliferous drainage (AMD) and neutral metalliferous drainage (NMD) can present significant challenges for water management.

The common approach to treatment of large water bodies has been to pump affected water to a centralised neutralisation treatment plant where it undergoes a series of physical and chemical processes under controlled conditions. While modern treatment plants can be very efficient, they are also expensive to construct and operate.

THE IN-SITU ALTERNATIVE

An alternative or complementary approach is to treat impacted water at the source using in-situ treatment techniques, typically a combination of reagent mixers and dosing lines. Portable modular plant can be used to treat the water body directly at a fraction of the cost of conventional treatment facilities (hundreds of thousands versus millions of dollars), and can be deployed within days or weeks (rather than the many months to years needed for design and construction of a centralised treatment plant).

Another important benefit is that the rate of in-situ treatment is limited not by the rate at which water is passed through a plant, but by the rate at which treatment reagents can be dispensed into a water body—continuous plant typically dose at rates of <10 tonnes of reagent per day, whereas in-situ treatment can typically dose up to 50 tonnes or more per day. This means that the treatment rate is measured not in litres per day, but in the time taken to treat the entire water body.

The advantages of in-situ treatment include:

- Low capital cost
- Systems can be designed to mix and dispense essentially any dry powder or liquid reagent, either as a solution or slurry.
- Systems are modular and small enough to be deployed to remote, difficult-to-access sites by conventional road transport.
- Systems can be configured for routine batch treatment, continuous treatment, pre-treatment in combination with continuous



treatment plant to significantly reduce plant capacity, supplementary treatment prior to discharge, rapid response or even emergency response situations.

- Systems can be applied to pit lakes as well as tailings ponds, heap leach ponds, water storages, stormwater, process water and even waterways.
- In-situ treatment is routinely far more rapid than conventional continuous treatment plants.
- Systems can be powered by site electricity or diesel generator.
- Contract treatment provides an alternative to purchasing costly infrastructure, additional staffing and ongoing maintenance costs, thereby reducing the strain placed on in-house resources.

The in-situ treatment service includes pre-treatment site assessment and water quality characterisation, as well as post-treatment water quality monitoring and reporting.

PROJECT EXPERIENCE

Successful in-situ treatment and monitoring of AMD- and NMD-affected water bodies at mine sites throughout Australia, including pit lakes, tailings storage facilities and process water dams.



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