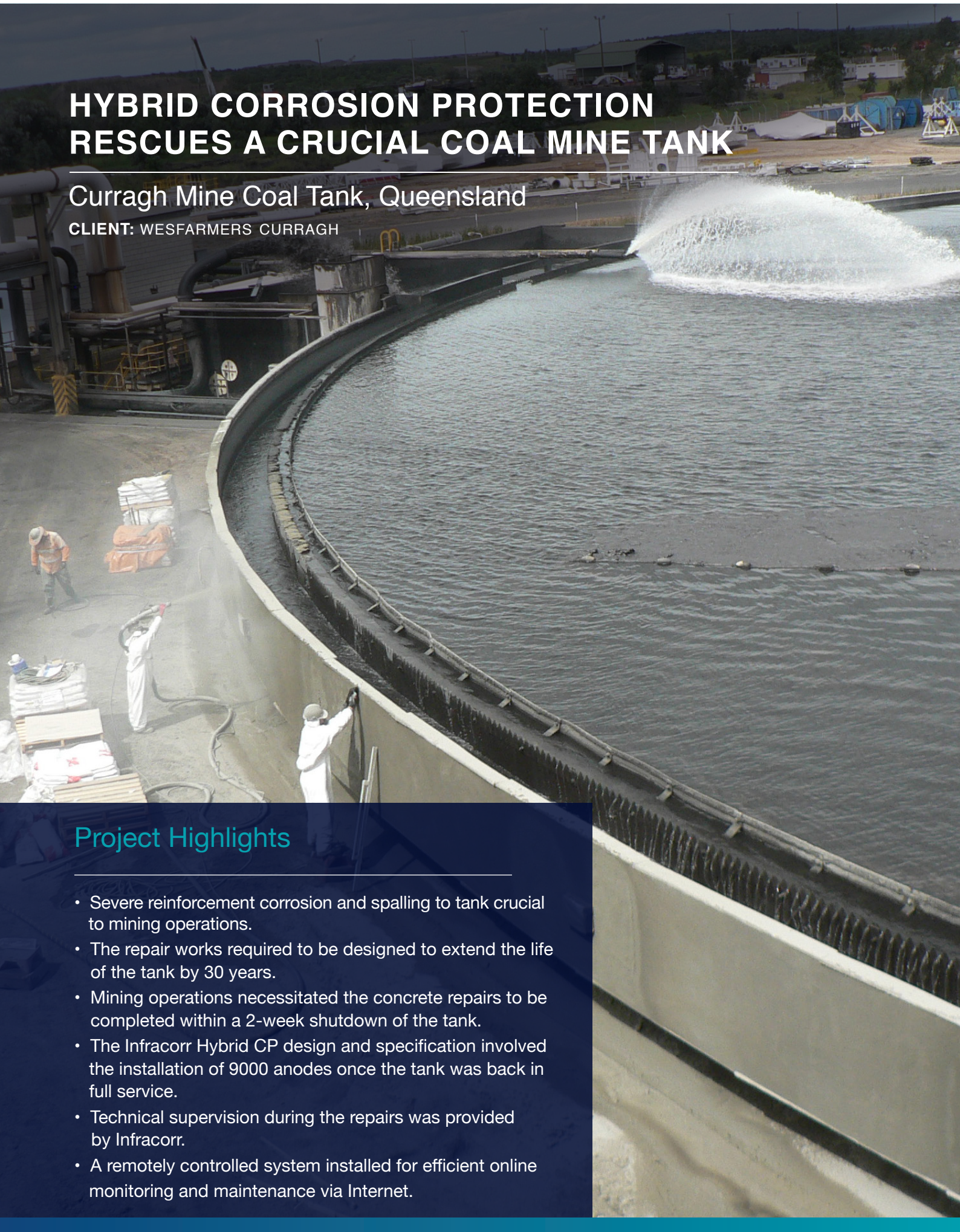
infracorr

HYBRID CORROSION PROTECTION RESCUES A CRUCIAL COAL MINE TANK

Curragh Mine Coal Tank, Queensland

CLIENT: WESFARMERS CURRAGH



Project Highlights

- Severe reinforcement corrosion and spalling to tank crucial to mining operations.
- The repair works required to be designed to extend the life of the tank by 30 years.
- Mining operations necessitated the concrete repairs to be completed within a 2-week shutdown of the tank.
- The Infracorr Hybrid CP design and specification involved the installation of 9000 anodes once the tank was back in full service.
- Technical supervision during the repairs was provided by Infracorr.
- A remotely controlled system installed for efficient online monitoring and maintenance via Internet.

infracorr

HYBRID CORROSION PROTECTION RESCUES A CRUCIAL COAL MINE TANK

Curragh Mine Coal Tank, Queensland

CLIENT: WESFARMERS CURRAGH

The reinforcement corrosion and spalling was due to chloride contamination occurring in the walls of the Coal Thickener Tank at the Curragh Mine. Infracorr Consulting designed, specified & supervised major concrete repairs and the installation of a Hybrid CP system to extend the life of the tank, the design enabling Wesfarmers to put the tank back into full service without major interruption to mine operations.

Section of tank wall after hydro-demolition of delaminated concrete.

Installation oh Hybrid CP anodes after initial application of dry-process gunite over reinforcement and tank back in service.

Application of final layer of dry-process gunite over Hybrid CP anodes and cables. With tank back in service.

CHALLENGES

The design required the concrete repair works to be performed and sufficiently cured within a 2 week shutdown period, after which time the plant and equipment loadings would be reapplied to the walls and the tank put back into service.

As the extent of reinforcement corrosion was such that simple 'patch' repairs would not be sufficient to provide the 30 year life extension to the tank required by Wesfarmers, a cathodic protection system needed to be designed to achieve this aim.

SOLUTION

The design required the concrete repairs to be performed as rapidly as possible. Hydro-demolition was chosen to remove all the delaminated concrete, and dry-process gunite application selected to backfill the repair areas.

The Hybrid CP system was considered by Infracorr to be the optimum CP solution for Wesfarmers, as:

- It eliminated the need for a permanent power supply.
- It significantly reduced the extent of permanent cabling and conduiting.
- It will minimise the ongoing maintenance costs.

In total, over 9000 individual anodes were installed at a spacing of 250-350mm, all while the tank was back in full service. A temporary power supply applied a 12 Volt DC current during the initial Impressed Current Phase of 7 days. Once the design criteria was achieved, the anodes were connected in Galvanic mode for the ongoing protection to the reinforcement.

RESULTS

The hydro-demolition/dry-process gunite concrete backfill techniques were successful in completing the concrete repairs within the 2-week shutdown, thus allowing the tank to be put back in service as programmed by Wesfarmers.

The Hybrid CP system has been designed to allow regular and cost-effective remote monitoring of its performance from anywhere where there is Internet access. Monitoring thus far indicates that the CP system is protecting the reinforcement as the design intended, i.e. and will provide a 30 year life extension to the tank.

The repair works were undertaken by Freyssinet Australia and Marine & Civil Maintenance joint venture. Supervision and commissioning was completed by Infracorr.

INFRACORR CONSULTING PTY LTD

p: 1300 805 089
e: info@infracorr.com
www.infracorr.com

20 Business Park Dve
Notting Hill, Victoria
Australia, 3168

MELBOURNE | SYDNEY | MACKAY

ABN 61 107 906 678