



A COMMERCIAL APPLICATION OF VIROFLOW™ TECHNOLOGY

CASE STUDY: QUEENSLAND RAIL

ViroFlow™ Technology can be easily integrated into any aquatic system for the effective removal of lead and other heavy metal contaminants in an environmentally friendly and cost-effective application.



Lead-based paint for infrastructure protection requires long-term solutions



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PROBLEM

The use of lead-based paint for infrastructure protection (roads and bridges) has been widespread in Australia for many years. The problem arises from the water blasting of these structures during periodic maintenance and re-painting. Historically, lead-contaminated water generated from this process was simply discharged to the local environment without treatment. Queensland Rail (QR) conducts this water blasting on a number of bridges and wants a long-term and more sustainable and environmentally friendly “best practice” solution for the potential surrounding environmental risks that it creates.



Figure 1 - Queensland Rail - Investing in sustainable best practices

VIROTEC TOTAL SOLUTION

An innovation from Virotec has enabled the collection, treatment and re-use of lead-contaminated water from QR's railway bridge maintenance using ViroFlow™ Technology. ElectroBind™ reagent removes all soluble lead and other heavy metal contaminants from the water and forms a dense solid precipitate that can be classed as an inert waste. The treated water can then be pumped out and re-used for numerous beneficial reasons. This Technology can easily be integrated into any aquatic system to effectively remove all lead and other heavy metals from contaminated water in an environmentally friendly and cost-effective application.

BACKGROUND

QR is committed to ensuring that rail remains Australia's most environmentally sound method of large-scale transportation. The lead-contaminated water produced from QR's railway bridge maintenance was being released into the surrounding environment, which posed a potential risk.

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To minimize their environmental impact and as part of their internal water conservation campaign, QR researched the benefits of ViroFlow™ Technology and implemented this application as part of a long-term sustainability operation.



Figure 2 - One of the QR bridges treated by Virotec reagents

TREATMENT METHOD

For four months Virotec collected the wastewater in a holding tank where it was then transferred via a vacuum tanker to an off-site treatment facility where ViroFlow™ Technology utilising ElectroBind™ reagent was applied. ElectroBind™ effectively removes all soluble lead from the wastewater, and forms a dense solid precipitate that can be classed as an “inert waste”. The result is treated water that is free from lead and other heavy metal contaminants.

The treated water is later re-used for beneficial purposes. Specifically, the treated water (after validation) is used at a local composting facility as an essential ingredient for the composting process. The re-use effectively lowers the need for external water to be used. Virotec is currently treating and re-using approximately 10,000 litres per month.



Figure 3 - Vacuum tanker

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RESULTS

The table below shows that ElectroBind™ reagent was successful in ensuring that the lead concentration in the treated wastewater was consistently under the required ANZECC limits for irrigation.

TABLE 1: AFTER TREATMENT RESULTS AND TARGET LIMITS

Lead concentrations after treatment with ElectroBind™ reagent (mg/L)	ANZECC irrigation limits (mg/L)
<0.005	5
<0.005	5
0.021	5
0.008	5
<0.001	5
<0.01	5

CONCLUSION

ViroFlow™ Technology can be easily integrated into any aquatic system for the effective removal of lead and other heavy metal contaminants in an environmentally friendly and cost-effective application.