



Case Study: Underground Coal Mine

Aeris Biological Systems remediation process increases productivity, enhances operational safety standards and maintains environmental standards for sustainable development

Summary

In March 2007 Aeris Biological Systems (“Aeris”), a wholly owned subsidiary of ASX listed Aeris Technologies Ltd, signed a 12 month Special Purchase Agreement with a major coal mine to treat a large underground water circuit with Aeris’ patented Multi-Enzyme technology. The primary objective of the supply agreement is to maximise mine production by removing unscheduled filter maintenance from the long wall dust suppression and firefighting supply water circuit.

The Mine’s Problem

In late 2005 the mine asked Aeris for assistance in solving a productivity and safety issue. The mine’s long wall dust suppression and firefighting supply water circuit was experiencing significant and increasing filter blockage from “debris” in the water.

This debris turned out to be slime (also known as biofilm) which naturally and commonly forms in flowing water. An example of this happening in nature is the slime that forms on rocks in a fast flowing stream. In large water circuits this slime can also harbour harmful bacteria such as Legionella.

The water in this circuit was sourced from a disused mine and, due to environmental requirements, was not being treated with any bacteria-reducing chemicals. As a consequence the slime build-up in the water pipes had got to a point where the filters were being blocked 3 times a shift (for each of the 3 shifts a day) causing an unnecessary and costly impact on productivity.

Case Study

The AerisGuard™ Solution

Aeris took and analysed samples of the slime from the water circuit and developed a customised formulation of its patented AerisGuard Multi-Enzyme Biofilm Removal technology. Aeris recommended a complete remediation of the long wall dust suppression and firefighting supply water circuit to unclog the water circuit and to control the build up of slime to maintain productivity and safety.

In September 2005 Aeris dosed the mine's water circuit with 200 litres of its AerisGuard Multi-Enzyme Biofilm Removal solution. The results were immediately apparent. The day after the remediation the filters stopped being blocked, and remained unblocked for about 2 months.

After 2 months the slime had built up in the water system to an extent that the filters were again being blocked and again causing productivity issues. (Note: It is not possible to totally eradicate slime (biofilm) from a water system that has a history of slime contamination. A maintenance regime is therefore required to control the build-up).

Aeris is now supplying a remediation service every 3 months to the coal mine.

The Remediation Process

1. The AerisGuard Multi-Enzyme Biofilm remediation process is un-complex and can easily be achieved during a scheduled maintenance shut down period.
2. The correct dosage of the AerisGuard product is applied at the head (inlet) of the circuit.
3. Once the product has flowed throughout the circuit (confirmed by taking water samples at the outlet) the water system should be shut-off to allow the Multi-Enzyme formulation to "digest" the slime.

The AerisGuard technology is based on 10 years of research and development into biofilm removal. It has been applied across numerous applications such as air conditioning and refrigeration systems in global markets such USA, Europe, Asia and the Middle East.

- Ideally the AerisGuard formulation requires 8 hours digestion time although success has been achieved after as little as 2 hours.
4. Once the slime has been digested the entire water circuit is flushed into the discharge outlets, removing the slime from the piping.
 5. Water samples are taken before and after the treatment to confirm the effectiveness of the treatment.

Benefits of AerisGuard to underground coal mines

- Productivity – treating the water circuit during scheduled maintenance periods provides freedom from unscheduled filter maintenance for approximately 3 months after each treatment.
- Safety – the AerisGuard technology maintains the critical firefighting water circuit.
- Environment – a key initiative at this mine is to minimise its impact on the environment and on surrounding communities. The AerisGuard Multi-Enzyme Technology's environmental impact has been assessed by the mine's Environmental Committee and approved for continuing use.

Are there alternative treatments?

There a number of chemicals on the market defined as "biocides" which are used to kill the bacteria in water circuits (basically they sterilise the water) and hopefully prevent development of slime (biofilm). These biocides are generally very effective in killing bacteria but have little effect on biofilm once it gets a hold within a water pipe system. Once the pipe system is "inoculated" with slime the only real solution is the AerisGuard Multi-Enzyme technology.

Importantly, the majority of biocides are not considered environmentally-friendly.



Aeris Biological Systems - a division of Aeris Technologies
5 / 26-34 Dunning Avenue
Rosebery, NSW 2018
Tel: +61 2 8344 1315
Fax: +61 2 9697 0944
www.aeris.com.au