

AUSTRALIA

# BULK

## HANDLING

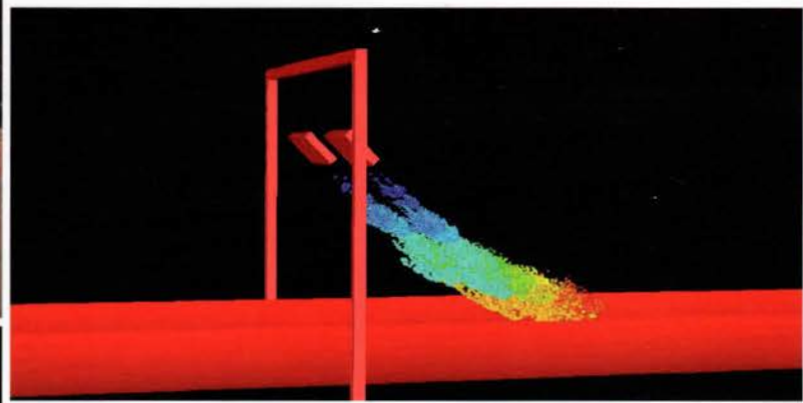
## REVIEW

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Volume 21 No 6 | November/December 2016



**EnviroMIST**  
Micro Mist • Macro Solutions



**EnviroMist Innovative  
Solutions to Coal Dust Problems**



# Development of a dust suppression system for longwall BSL and discharge hood at Grosvenor Mine



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## Background

Respirable dust exposure has long been known to be a serious health threat. In coal mining, exposure to respirable dust can lead to Coal Workers Pneumoconiosis (CWP) or Silicosis.

CWP and Silicosis are diseases of the lung that can be disabling and even fatal in their most severe form, and once contracted there is no cure. For the past 30 years, it was believed that CWP had been eradicated from the coal mining industry in Australia; however, after several confirmed cases of CWP in 2015, Queensland Minister for Natural Resources and Mines, Anthony Lynham initiated a plan to address the issue. After further investigation, additional cases of the disease were confirmed and as of 11 October 2016 there have been a total of 16 cases of CWP confirmed.

The re-emergence of CWP in Queensland coal mines prompted Anglo American to re-assess its dust control systems and develop industry-leading dust mitigation controls to ensure the safety of its workers. As part of its strategy, Anglo engaged award-winning dust suppression specialist EnviroMist to assist at its Grosvenor mine.

Grosvenor is a greenfield metallurgical coal operation in Queensland's Bowen Basin owned and operated by the world's third largest exporter of metallurgical coal, Anglo American. Located approximately 190 kilometres south-west of Mackay, Grosvenor first achieved longwall coal in mid-2016 with the longwall and development units expected to produce approximately 7Mtpa over an anticipated mine life in excess of 30 years.

EnviroMist is an Australian owned company, operating out of Brisbane, providing turn-key dust control and dust suppression engineering solutions. EnviroMist has developed operations-ready solutions across a range of surface and underground applications including ROM dump stations, rotary breakers and crushers, conveyor transfer points, BSL discharges, and rotary car dumpers.

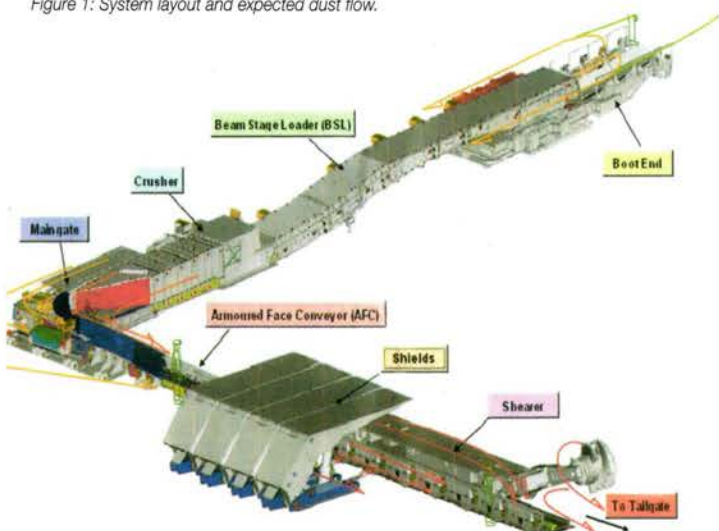
The collaboration between Anglo American and EnviroMist technology was undertaken with the goal of limiting coal mine worker exposure to respirable dust and therefore, to preventing the threat of dust related diseases.



## The problem

Early longwall production at Grosvenor mine highlighted areas of excess dust emissions. Of particular concern was the BSL discharge point, where coal is loaded onto the longwall section belt. Static monitoring conducted by both Grosvenor and GCG hygienists indicated that the BSL discharge contributed to the intake respirable dust concentration by up to 2 mg/m<sup>3</sup>/shear. Additionally, reduced visibility was significant and noted as becoming more prevalent as production increased to near nameplate capacity.

Figure 1: System layout and expected dust flow.



Prior to commencement of the EnviroMist project, there were existing controls in place, including a scrubber and various water sprays; however, these systems were unable to completely eliminate the dust liberated from this source. In response, a solution using EnviroMist's micro-mist technology was pursued. Figure 1 details the mining arrangement and dust flow due to ventilation.

## The solution

The solution to the dust issues around the BSL was the application of EnviroMist's innovative high-energy micro-mist dust suppression technology. These systems use specially developed nozzles operated at pressures in excess of 100 bar to produce a high-energy mist with controlled droplet size, velocity, water consumption, and spray angle. A system such as this allows dust capture to be maximised whilst reducing negative side effects generally found such as belt flooding, overspray and unwanted dust diversion.

Figure 2 demonstrates the high density mist that is produced by the EnviroMist nozzles in comparison with a standard nozzle that is commonly used for dust suppression purposes. Ultra-fine droplets are a key aspect in effective dust capture as droplets similar in size to the dust particles themselves are much more



Figure 2: Left: Standard pressure atomiser captured @10,000 fps. Right: High energy micro mist captured @10,000 fps.

## NEW DEVELOPMENT IN SUSTAINABLE AIRBORNE DUST SUPPRESSION



### COAL MINES AND HARD ROCK MINES APPLICATIONS:

- ROM Bins
- Transfer Points/ Chutes
- Crushers
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