

AUSTRALIA BULK HANDLING REVIEW

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- BHP's 11km conveyor for Bowen Basin
- \$10bn Inland Rail a boon for bulkies
- Conveyor monitoring with fibre optics



Nozzles ain't nozzles

To the uninitiated, close enough is good enough when it comes to selecting nozzles for dust control applications in mines and industrial plants. The reality is far different with hard science and analysis behind the best systems.

In 2016, Anglo American had a big problem with dust at its brand spanking new Grosvenor mine, a state-of-the-art 7mtpa longwall 190 kms south-west of Mackay in Queensland.

Despite the use of water sprays and a scrubber, dust around the beam stage loader (BSL) discharge point was excessive, reducing visibility. With incidences of Black Lung emerging recently in Australia, Anglo immediately got on the front foot.

It tasked Brisbane-based EnviroMist, a specialist dust suppression firm, with devising a solution. EnviroMist had plenty of experience in using its high-energy micro-mist systems in such applications. These systems use specially developed nozzles at pressures in excess of 100 bar to produce a fine mist with controlled droplet size, velocity, water consumption and spray angle. The key in such systems is to eliminate dust but without excess water causing flooding. The latter problem has arisen in many underground mines that have bumped up water spraying in response to concerns over Black Lung.

To perfectly tune its system EnviroMist worked with the University of Wollongong. Researchers' testing and analysis included work on mist profiles and velocity, water consumption, cross-flow dynamics and noise levels. Data was used to develop static and simulation models, showing how the system would perform prior to installation. In



Nozzles ain't nozzles: (left) standard pressure atomiser captured @10,000 fps; and (right) high energy micro mist at 10,000 fps.

particular, a numerical model ensured that droplet size and momentum was adequate to avoid mine ventilation and dust cloud momentum adversely affecting the performance of sprays.

The final solution consisted of 12

sprays: four at the intake of the crusher, four inside the BSL discharge hood, and four mounted on the boot end. It worked. Anecdotal evidence from main gate operators was of a dramatic decrease in dust. ■

NEW DEVELOPMENT IN SUSTAINABLE AIRBORNE DUST SUPPRESSION



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