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2022 | March

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EnviroMist® Successfully Supplied South Flank Dust Suppression System

ROM DUMPING OPERATION AT SOUTH FLANK MINE

EnviroMist was contracted in 2018 to supply dust suppression systems for the two new ROM dump stations at the BHP South Flank mine. The contract was extended in 2020 to include two additional dust suppression systems for the new COS stacker conveyors.

The company's designs focus is on introducing correct sized water droplets into the appropriate location to capture fugitive dust. To achieve this, EnviroMist adjusts system operational parameters, equipment selection and design layout to suit the particular constraints of the site.

The South Flank ROM and COS systems have similar filter, tank and pump arrangements, however they deliver the water using different spray bar and nozzle configurations to achieve the goal of effective dust suppression.

The ROM dust suppression system is designed to create a water pressure curtain across the top of the bin by spraying minimal water at high pressure and high velocity to create a cloud like cover. When a truck dumps its ore, the liberated dust entrained in the air tends to shoot out of the top of the opposite side of the bin with the air flow. When the air and dust hit the water pressure curtain generated from the dust suppression system, most of the air and dust is confined within the bin, allowing the billions of tiny droplets to capture the dust and settle it back into the bin.

The COS conveyors discharge the ore from height into a very open area subject to high velocity cross winds. The large volumes of falling material along with the open spaces results in a very difficult dust suppression environment. EnviroMist's goal in these arrangements is to get the dust suppression sprays to penetrate the ore stream as it starts to separate, wetting the dust and keeping it within the falling stream.

To achieve this goal, EnviroMist primarily utilises water misting heads on COS systems. The misting heads combine EnviroMist's patented discharge nozzles into a single concentrated stream, resulting in a high-pressure cone of water that can be projected towards the falling ore.

The overall effect is like a fire hose spray consisting of billions of tiny water droplets which can be directed accurately at the material flow. The high-pressure water streams are aimed at the falling ore in different locations, impacting the ore as it starts to separate under the conveyor head pulley.

The tiny droplets penetrate the gaps in the ore stream, integrating the billions of water droplets into the midst of the falling ore. At South Flank mine, the two COS dust suppression systems significantly reduce the dust generated from the stockpile feed conveyors.

EnviroMist's high energy dust suppression systems run at high pressure. Billions of tiny water droplets are created by the company's systems, leading to large coverage areas with low water usage when compared to low pressure dust suppression systems.

The high pressure, high velocity water droplets are so small that a low-pressure system spherical water droplet of 1mm in diameter has the same volume of water as 15,000 high pressure water droplets in a standard EnviroMist configuration.

The company's proprietary technology allows tuning to match the water droplet size to the dust particle size by modifying system operating parameters along with nozzle and spray bar configurations.

The D50 size of water droplets produced by EnviroMist's system can be adjusted – from 3.0 microns up to 150 microns - to best match the type of dust that is being targeted, the specific application, site constraints and other design factors.

EnviroMist's nozzles and spray arrangements are custom designed and manufactured in Australia. The design, quality of materials used, quality-controlled manufacturing process, and high-pressure venturi-based delivery system result in very low maintenance requirements, particularly at the spray end of the system.

EnviroMist have never had a nozzle failure or blockage reported apart from where the sprays have been mechanically damaged by rocks or machinery.

When starting new designs, all aspects of equipment lifecycle costs are considered including installation, operations, and maintenance. EnviroMist's systems can use most mine water sources for dust suppression activities, therefore potable water is not required. No additives are normally required to run the systems, reducing operational costs.

EnviroMist supplied systems and components meet all relevant Australian and applicable mining standards.

EnviroMist is constantly improving its

designs based upon feedback received from its installed systems. All new large systems now include fully functional control systems with HMI interfaces and sufficient instrumentation to monitor all critical system parameters, allowing operators to see and understand how the system is performing, and maintainers to predict when system components may require maintenance – such as filter cleaning, oil changes and other similar activities.

The control system sits on a PLC compatible with site standards which reduces training requirements and spares holdings.

EnviroMist dust suppression systems are also used extensively in underground coal mining operations, reducing dust levels during road development and on longwalls.

EnviroMist has participated in ACARP research and is constantly researching technologies to improve their systems. We actively seek alternate applications for the technology such as installing sprays on drill rigs or utilising the sprays on fire suppression equipment.

Recently EnviroMist was commissioned to design dust suppression systems for other mine sites based on South Flank installation.

EnviroMist is an Australian company producing unique, custom-designed, dust suppression systems for the mining industry, safeguarding worker safety and reducing environmental impacts of mining operations.

EnviroMist's goal is to develop dust suppression systems made from high quality components, having low maintenance requirements and are effective in suppressing the dust liberated from falling ore streams. We have a very strong customer focus and are constantly upgrading designs based upon "lessons learned" from previous installations.

EnviroMist is an ISO9001, ISO14001 and ISO45001 certified company. **AMR**

For more information:
www.enviro-mist.com.au



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We provide large scale dust suppression applications in iron ore and coal underground and above ground operations, with immediate and significant dust level reduction around material handling areas.

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APPLICATIONS

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