GE Power & Water
Water & Process Technologies

Case Study

Dust Suppression Strategy Saves Gold Mine US$378,000 Annually

Challenge

High dust levels were a concern for Newmont Mining Corporation's Eastern Operations in the state of Nevada, in the western United States. The mine roads are heavily trafficked by large, heavy trucks and light vehicles. The severe dust raised by this traffic had greatly reduced visibility for the drivers and was a respiratory issue as well. There were also environmental concerns with chloride runoff.

Initially the mine controlled the dust with a magnesium chloride solution. However, that required several water trucks (30,000 gallons each) to water the roads up to 18 times per day, seven days per week, amounting to over 100 million gallons of water during a 7 month dusty season. Chloride-containing runoff was making its way to nearby Rodeo Creek, and eventually the Humboldt River. The road surface needed to be watered and graded on an ongoing basis. Moreover, the mine also incurred a significant fuel expense for the grader and watering trucks, which produced undesirable greenhouse gas (GHG) emissions.

Solution

In partnership with Newmont, GE's Water & Process Technologies developed a long-term strategy to maximize the mine's water and energy resources, based on GE's broad portfolio of global expertise and local capabilities. The team implemented a dust-suppression strategy centered on GE's practically non-toxic DusTreat* DC9112 organic binding agent.

Figure 1: Access road to Newmont's Leeville Mine

Once this binding agent has been applied and has cured, it renders the roads surfaces hard, while making the road dust-free and non-slippery for an extended period. On an ongoing basis, as trucks travel the road creating new dust, and eventually spill dusty material on the surface, all that is necessary to maintain good dust control, is a light watering to rejuvenate the product. This process needs to be done far less frequently than before the DusTreat application.

Results

This dust-suppression strategy introduces no chlorides into the environment, has kept dust levels low, and has greatly improved driving conditions. Switching to DusTreat DC9112 Program from a water and magnesium chloride treatment on 7 miles of haul roads reduced water use for dust suppression by 90% or 110 million gallons of water over a 7 month period, equivalent to the water consumption of over 1300 average U.S. households during that period.

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Figure 2: Mine haul road before DusTreat program

Figure 3: Mine haul road after DusTreat program

Furthermore, the project also reduced CO_2 emissions from fuel consumption by 490 metric tons – equivalent to the CO_2 emissions of over 165 average cars on U.S. roads during that period.

"Our partnership with GE has led to great operational benefits and significant cost savings," said David Sirotek, general foreman of mine operations for Newmont's Eastern Nevada Operations. "The reduction in water use has been dramatic, and the amount of attention we must pay to this road has decreased significantly, enabling us to use our time and resources elsewhere in the mine to improve productivity."