

Efficient Dust Suppression

By 2030 the Government has a target to reduce water consumption by 20%. The construction and quarrying industries use large quantities of water, most notably for dust suppression and so has an influence in how products are designed and built for operational use.

Minimising the use of potable (drinking) water provides both environmental and financial benefits to companies, especially in areas of water stress, such as the South-East region.

Good practice should be replicated on sites and new initiatives trialled in efforts to reduce water use. Our case study below looks at how a 1.5% increase in profit margin was delivered for Buckingham Group by initiatives undertaken by AcePlant.

What is it?

DIRFT III is a project with a construction footprint of 350 hectares. The works involves moving 2.5 million meters cubed of materials onsite and building an 1,800 metre spine road with a railway bridge. The undertaking involves ecological management, construction of a bat house and livestock building, watercourse diversions and drainage installation, along with associated new infrastructure services.

The project was aware that carrying out works during the summer period would require water to reduce dust impact to road users, neighbours and ecological receptors.

Traditionally a dampening system, which uses pressure to discharge water from a bowser onto a splash plate diffusing this outwards would be used in this situation. On average, this type of system uses 2,000 gallons of water in 8 minutes and the method is uncontrolled.

The project knew that water would be a scarce commodity over the busy summer period as no mains connection was available. Non-potable water was taken from settlement lagoons, however, this was limited but made use of to minimise the use of potable water.

Bowers with a hydraulic ultra-lightweight carbon fibre spinning disc were obtained and water was gravity fed onto the disc, resulting in the ability to provide a fine mist or site drenching deluge depending on the requirement of site conditions. The operator had the ability to regulate the discharge via a reducing valve to control the flow or by adjusting the speed of the hydraulic disc.

Why is it important to me?

This system proved to be drastically less resource hungry than traditional systems currently in use. The 2,000 gallons of water lasted 90 minutes, being over 10 times more efficient. The additional benefit was that plant usage was also much more effective.

In summary, the result of the initiative at DIRFT provided a cost saving of over £21,000 in water use alone. In a five-month period 25% of resources were saved equating to over 2,000,000 litres of water. The saving achieved would have been greater but an agreement was in place with a local quarry for the supply of water at a cost-effective rate.

IQ believes that good understanding of dust suppression is important for quarrying professionals to help improve operational performance and effectiveness on site.

Where Next?

Institute of Quarrying

IQ supports professionals working within the quarrying and minerals products industry through membership and training. These factsheets are produced across a range of topics to share ideas and best practice. Further information can be found via the resources section on the IQ website www.quarrying.org.

AcePlant

This factsheet case study has been produced in conjunction with ACE Plant who have been supplying a wide range of dust suppression equipment for the past 40 years. Environmental responsibility, particularly in the control of water usage, remains a significant component in the process of developing their new products.

Over this time, they have developed individually designed machinery and adapted standard equipment to provide bespoke suppression. With dust at work being one of the largest issues, they actively engage with their clients and work alongside suppliers to enlarge the range of dust-limitation machinery available.

All of Ace Plant's dust-suppression units are fitted with hydraulic vacuum pumps. This pressure-fed unit is fitted with a splash plate, making it particularly suitable for dampening down residual dust on haul roads etc.

For simple dust suppression, a tractor and tanker combination is available, in situations where water consumption is an issue, they have developed a hydraulically driven carbon fibre spinning disc assembly. Using less water than pressurised systems, the spinning disc makes water usage more efficient, economical and gives the operator greater control.

When a more targeted solution is required their rain gun provides an alternative solution. Powered by a high-capacity centrifugal hydraulic pump, a throw of up to 70m can be produced. The rain gun can be accurately directed and is powerful enough to be used for firefighting.

When fleet utilisation is an issue, their Quickspray loading shovel, telehandler forklift dust suppression unit product produces accurate and effective dust suppression, it also helps to ensure existing equipment fleets are used to capacity.