

DUST CONTROL COMPARISON GUIDE FOR MINE ROADS

A guide to using the most effective & economical dust control solutions for different types of roads.



Q. WHY WAS THIS EBOOK PRODUCED?

A. This document has been produced to provide a definitive guide on which type of dust control solutions are the most effective to use on different kinds of mine roads & unsealed access roads.

Q. WHO IS IT FOR?

A. It has been designed for Road Planners, Designers, Engineers and Superintendents so that adequate thought is given into choosing the right solutions for the right problems. This guide is a valuable resource whether a site is yet to be constructed or is already in operation.

Q. WHAT WILL YOU GET OUT OF IT?

A. The guide will explain the importance of using a combination of different dust control measures in order to achieve an all-encompassing approach to dust management.

Produced as an industry service by
Dust-A-Side Australia



For further information, expert advice or a quotation, call Dust-A-Side Australia today on

CALL 1800 662 387

www.dustaside.com.au

INTRODUCTION

Achieving an effective and consistent dust management solution for mining roads is an ongoing challenge for mine operators.

It's been readily established that wheel generated dust is the largest single contributor to total dust emissions on any open cut mine site. Furthermore, this dust subsequently has the potential to cause negative impacts on the environment as well as impact on the health of workers and neighbouring communities.

Despite the use of traditional dust suppression measures involving the use of water trucks spraying water, the generation of visible and respirable sized dust particles is all but inevitable.

Independent studies have concluded that best practice is the application of suppressant on haul roads [1]. Yet, using a dust suppressant is one thing – selecting the right type of product, implementing an effective application strategy, and monitoring its use on an on-going basis, are all critical to ensuring success both from a dust control and economical perspective.

In most cases, a holistic approach in determining the right solution – or combination of solutions – is needed. A typical mine site is made up of both permanent and short term roads and ramps which will need to cope with varying volumes of traffic.

A dust control measure which works for a temporary road won't necessarily work sufficiently or be cost-efficient on a permanent haul road.

This guide will highlight which Dust-A-Side road management solutions are typically implemented for different types of roads in terms of ensuring an effective yet economical approach to dust reduction.

Reference:

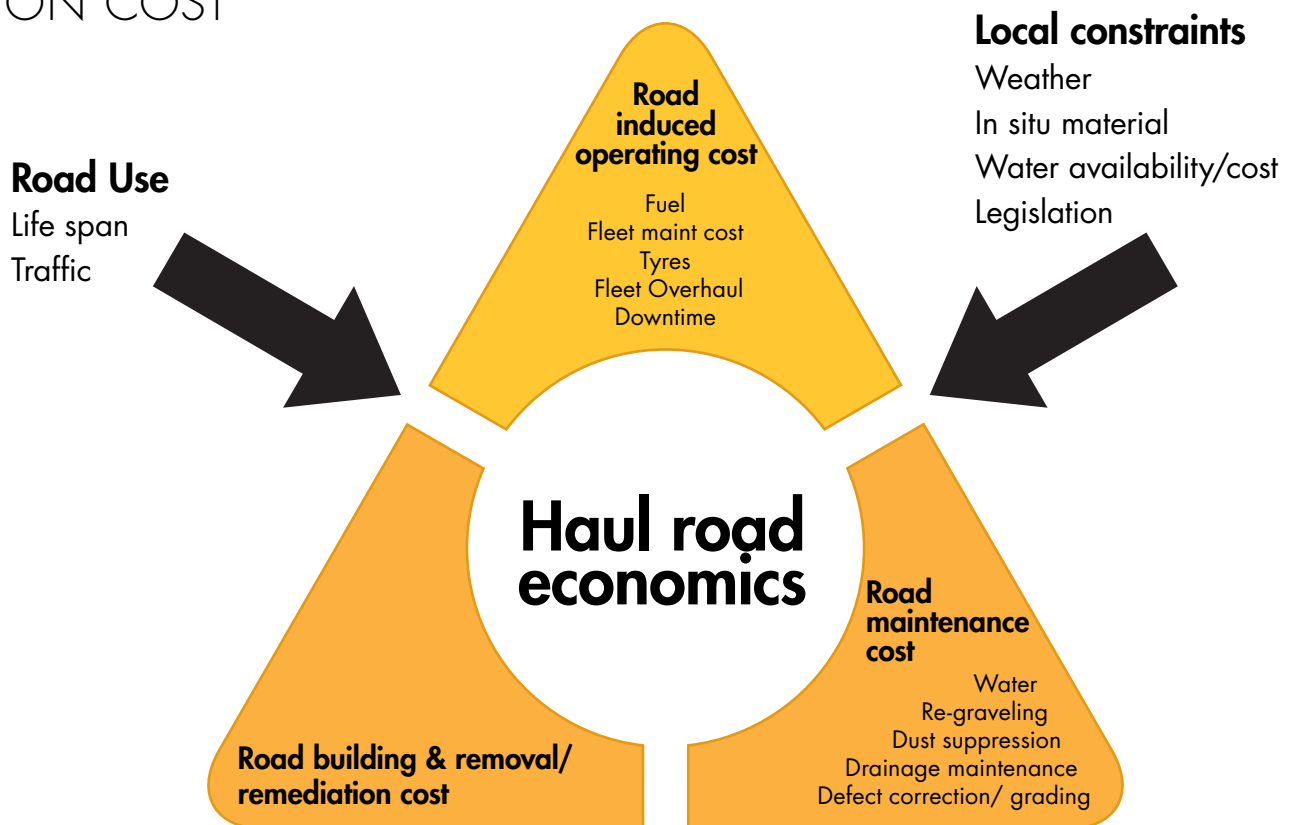
[1] NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining, Katestone Environmental Pty Ltd

MINE ROAD ECONOMICS

When it comes to mine roads, there is no single product that can be used to achieve total dust control. This is because roads need to be looked at holistically as there are many factors that will impact on their lifetime costings.

As shown in the diagram below, the following factors need to be taken into account when deciding on which combination of dust control solutions to use.

HOLISTIC CONSIDERATION ON COST

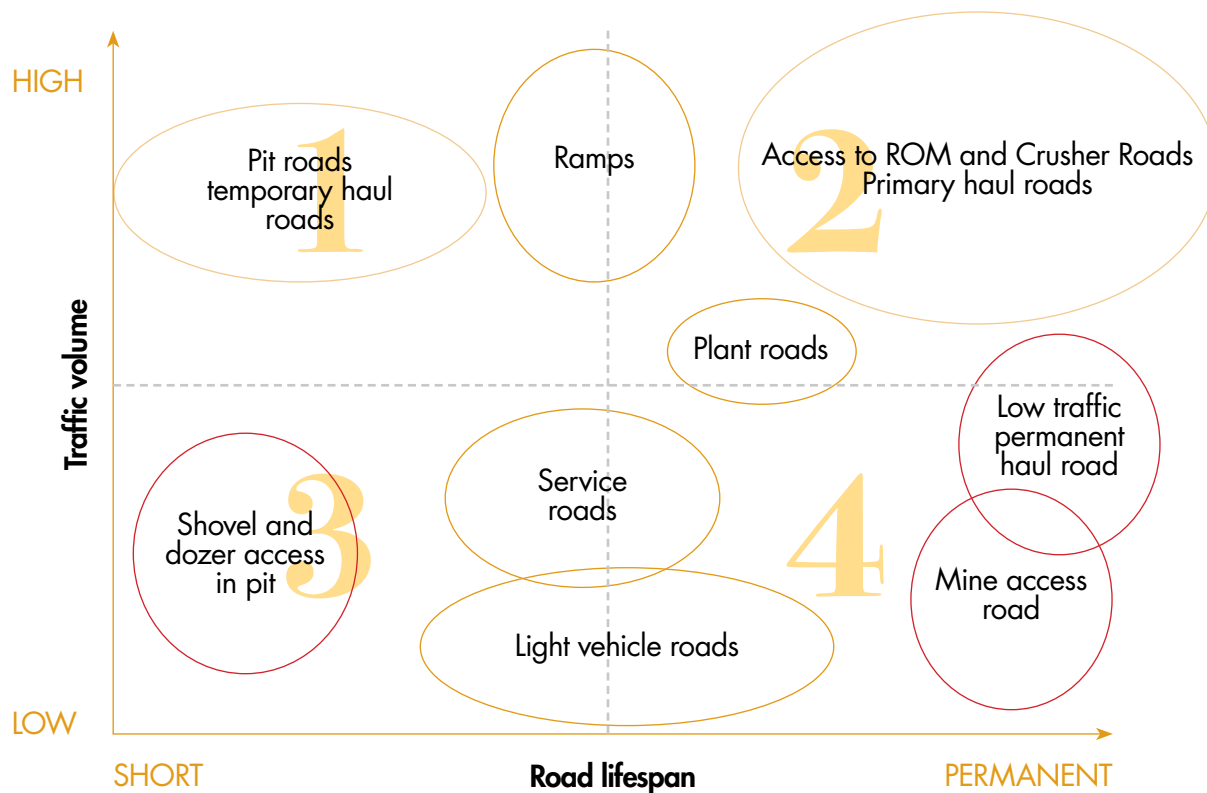


The performance of the surface course depends greatly on the road foundation. The wearing course (product & material) is to preserve the integrity of the road structure.

CLASSIFICATIONS OF MINE ROADS

Through the use of a quadrant system, the following chart can be used to provide a simple classification for the different types of roads and access points in the context of which Dust-A-Side road management systems are most recommended.

MINE ROAD CLASSIFICATION



DAS PRODUCT

This specially formulated bitumen emulsion is designed to stabilise and suppress dust on roads.

After application, DAS product forms an impermeable seal so that roads and other dust-bearing surfaces are dust and mud free and functional in all weather conditions.

For dust control and surface sealing results, the product can simply be used as a spray-on treatment; typically recommended for roads with a short lifespan.

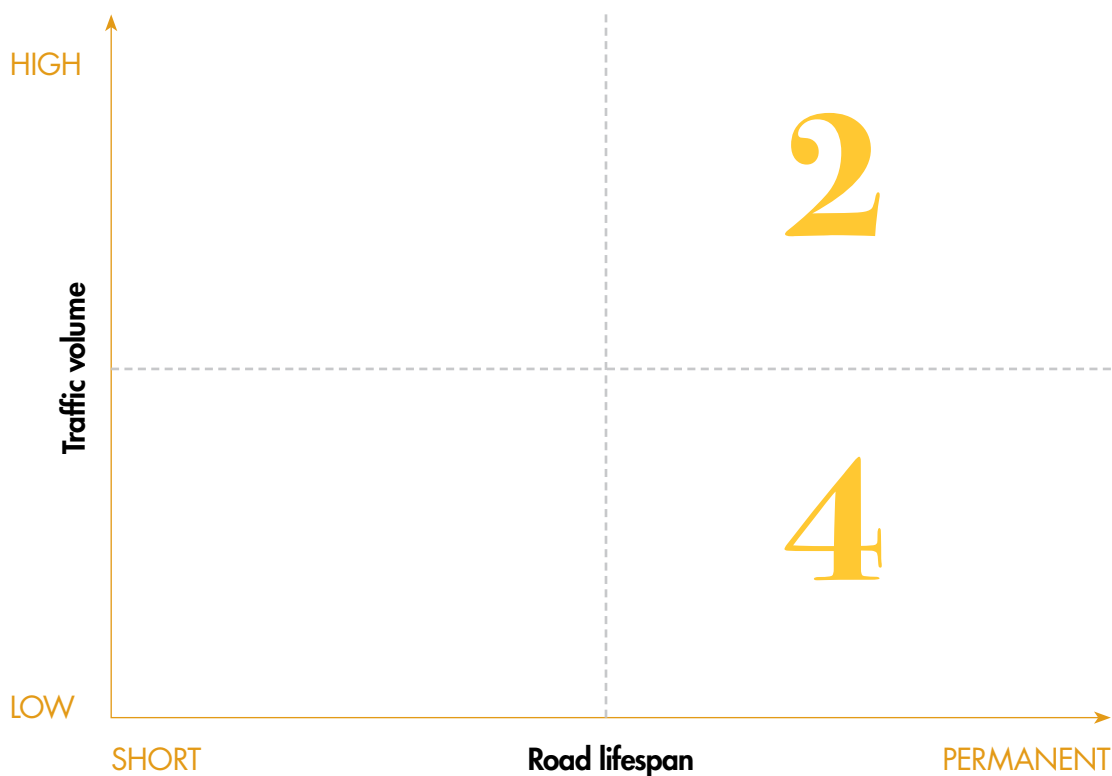
Alternatively, it can also be incorporated into the surface wearing course layer. This approach has been proven to yield the most productive roads at the lowest life-cycle cost, and is typically recommended for roads with a lifespan of 12+ months.

DAS product is suitable not only for use on roads, but hardstands and laydown areas as well.

Expected key benefits include dust reductions of 90%+ and a reduction of water usage by 95%+, when the full Dust-A-Side Haulroad Management System is adopted.



RECOMMENDED USAGE



HYDROTAC

Based on organic binder technology and surface active agents, this biodegradable binder is used to bind surface particles together on temporary roads with either low or high traffic volumes.

HydroTac can be used as a simple spray-on treatment which is absorbed into the surface material.

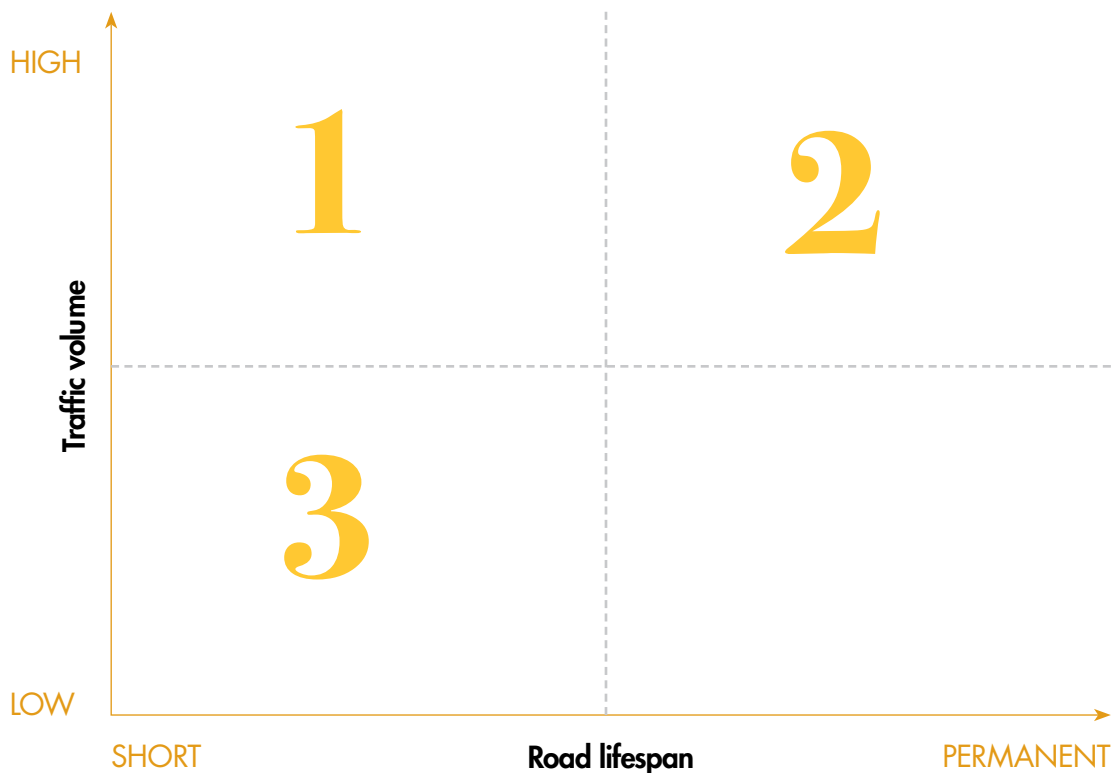
Or for more long term results in heavy traffic areas, it can be established into the surface wearing course layer via a stabilisation process.

Totally organic, it has no corrosive chloride compounds and is environmentally friendly & readily biodegradable.

HydroTac is highly effective on roads, hardstand areas, transport yards or other exposed surfaces. Expected key benefits include operational dust reductions and a reduction of water usage of up to 70%.



RECOMMENDED USAGE



ACRIBIND

Based on a blend of synthetic and organic polymer technology, AcriBind is a specially formulated blend of co-latex styrene acrylate polymer, lignosulphonate and surfactant.

It's suitable for short term roads with low to high traffic as well as permanent roads with low traffic.

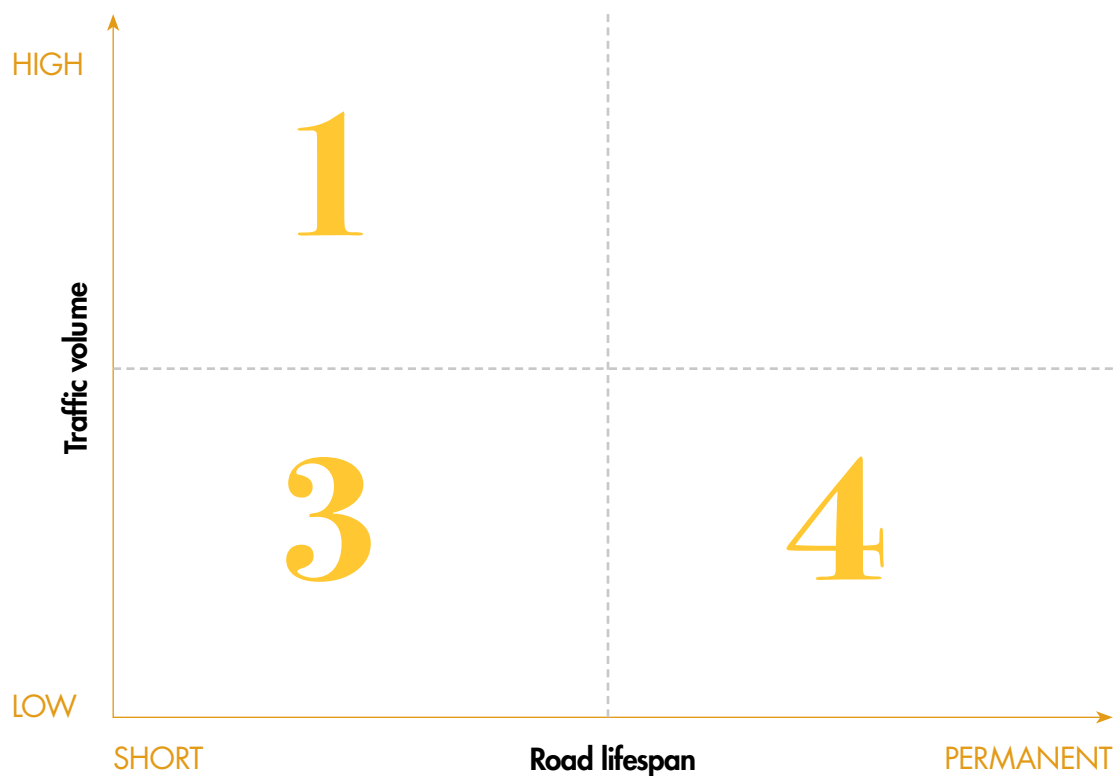
Delivered in a concentrated liquid form ready to use, AcriBind is typically diluted in a water cart at a concentration of 2% to 5% and applied via a simple spray-on treatment as part of the normal watering practice.

AcriBind is very easy to apply, with no need to build the product into the ground and is compatible with most water sources.

Over time, the polymer will accumulate and provide an effective seal over the exposed surface to control dust and reduce water ingress into the ground. Expected key benefits include operational dust reductions and a reduction of water usage of up to 75%.



RECOMMENDED USAGE



HYDROWET

HydroWet is a concentrated surface active agent.

While it doesn't contain binding abilities, it is specially formulated to improve the wetting ability of water particularly on hydrophobic materials.

As only a very low dosage is required, using HydroWet is a much more cost-efficient solution compared to using water only.

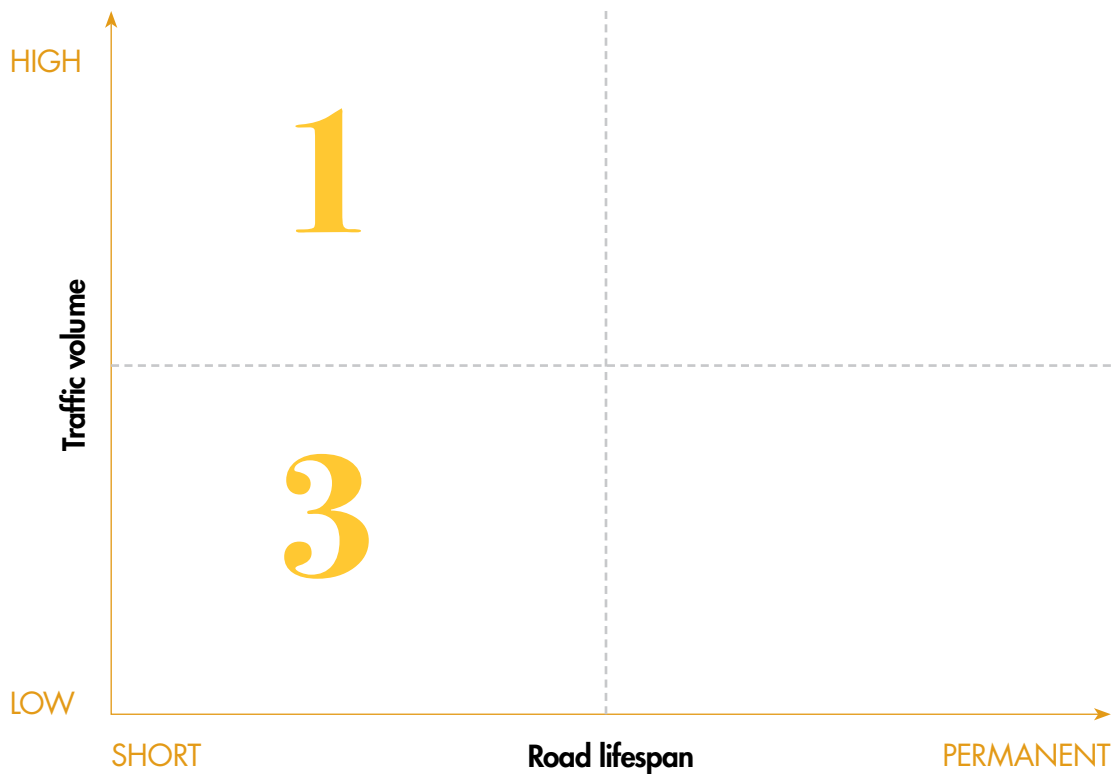
It is most effective for use on temporary roads and access points with either low or high traffic volumes.

HydroWet has a cumulative effect in suppressing dust on temporary roads, thus saving on water usage and water cart operating costs.

Expected key benefits include significantly reduced water usage and improved wetting of surfaces.



RECOMMENDED USAGE



AQUATARP

AquaTarp is a solvent-free, water and surfactant based emulsion of latex polymer.

Most suitable for permanent roads with low traffic volume, AquaTarp works to bind fine dust particles in order to create a crusting effect and produce a surface seal.

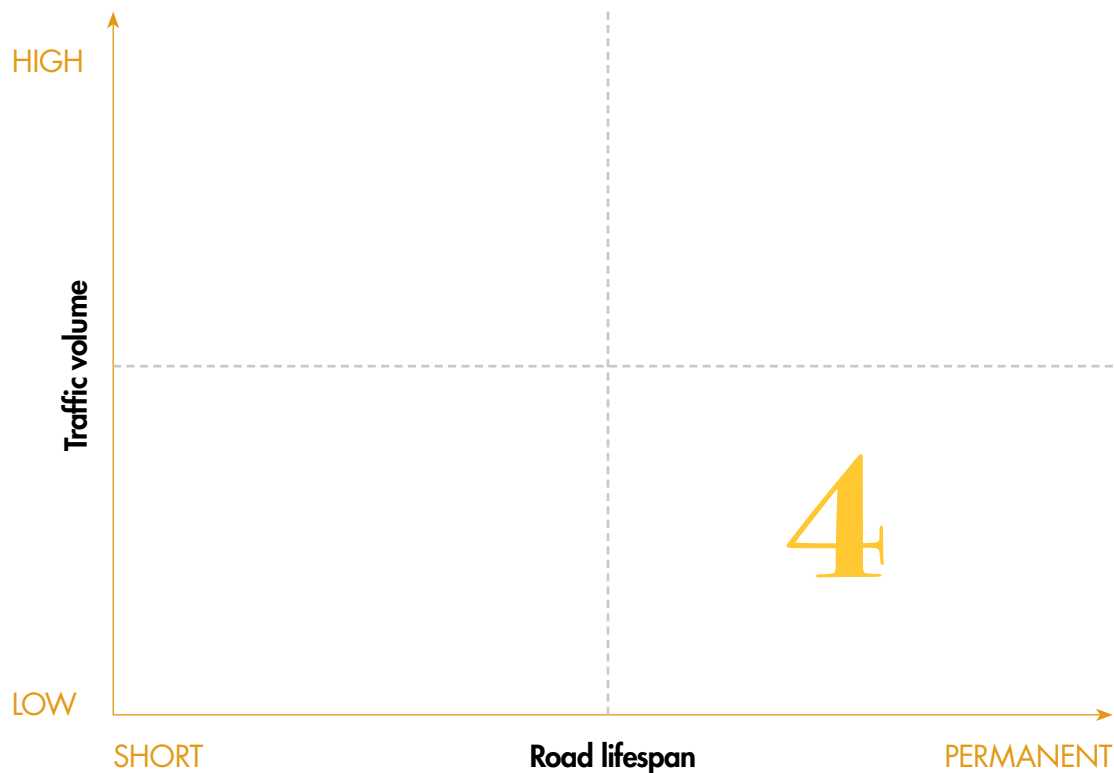
This seal exhibits extremely good wind and water erosion resistance whilst also preventing dust particles from being emitted into the atmosphere and sediment run-off.

It can either be sprayed onto existing roads or established into the surface wearing course layer to create a hard and stabilised surface. AquaTarp can also increase load bearing capacity.

Expected key benefits include operational dust reductions and reduced sediment run-off and surface erosion.



RECOMMENDED USAGE



SUMMARY

As this guide has outlined, there is really no “one size fits all” approach that can be applied to dust management for mine roads.

A combination of different measures needs to be employed in order to achieve the highest possible level of dust control across different types of roads and access points.

An all-encompassing dust management solution will improve economies of scale, drastically cut water consumption and prevent harmful dust particles from being released into the air.



DUST-A-SIDE IS PROVEN TO OUTPERFORM

Dust-A-Side is able to provide a tailored dust management solution for any type and size of mine.

Talk to Dust-A-Side today about arranging a free onsite inspection and preliminary report to find out how we can improve the quality of your site quickly and cost-efficiently.

For more information and advice about Dust Control on Mine Roads, please call

CALL 1800 662 387

and consult with one of our experienced engineers.

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