



envirosafe
solutions
better, safer, cleaner, greener

DUST SUPPRESSANT INFORMATION AND TRAINING GUIDE

INTRODUCTION

EXECUTIVE OVERVIEW

What is Extreme Green Dust Suppressant

Extreme Green Dust Suppressant is a bio-derived dust suppression and road stabilisation system designed for unsealed surfaces in mining, civil construction, quarrying, and industrial operations.

The product utilises Australian lignosulfonate, a naturally derived polymer extracted from lignin during the pulp and paper manufacturing process.

When applied to soil or road surfaces, lignosulfonate performs three essential functions:

- binds fine particles together
- reduces moisture loss
- stabilises the road surface

The result is a significant reduction in airborne dust generation, improved road durability, and lower operational costs.



MARKET POSITIONING

How is Extreme Green Dust Suppressant positioned within the current market?

Extreme Green Dust Suppressant is not simply a dust suppressant.

It is best understood as a road fines stabilisation technology.

Dust is not a separate problem – it is a symptom of fines leaving the road surface.

Extreme Green Dust Suppressant works by stabilising those fines.

This changes the entire operational conversation from:

“how do we stop dust”

to

“how do we keep the road intact”.

Why This Matters

Dust suppression is critical for:

Safety

Dust reduces operator visibility and increases accident risk.

Health

Fine particulate matter can cause respiratory issues.

Environmental compliance

Dust emissions are increasingly regulated.

Equipment longevity

Dust accelerates wear on machinery.

Community relations

Dust drift from industrial sites can create complaints and regulatory scrutiny.

EXTREME GREEN DUST SUPPRESSANT

PRODUCT INFORMATION:

Product Name

Extreme Green Dust Suppressant

Product Category

Dust Suppressant / Soil Stabiliser / Road Fines Binder

Active Chemistry

Australian Lignosulfonate polymer derived from lignin.

Product Positioning

Extreme Green Dust Suppressant is a bio-based dust control technology manufactured in Australia by an Indigenous-owned chemical company using locally sourced lignosulfonate raw materials.

Core Value Proposition

Extreme Green Dust Suppressant combines four strategic advantages:

Proven Chemistry

Lignosulfonate has been used globally for decades in dust suppression and soil stabilisation.

Sustainability

The product is derived from renewable Australian lignin extracted during paper production.

Local Supply

The lignosulfonate originates from the Australian pulp industry.

Indigenous Manufacturing

Extreme Green Dust Suppressant is produced by a 100% Indigenous-owned manufacturer.

Safety Classification

The lignosulfonate raw material used in Extreme Green Dust Suppressant is described in its SDS as non-hazardous and not dangerous goods.

This simplifies:

- transport
- storage
- site handling



EXTREME GREEN DUST SUPPRESSANT

DUST SCIENCE...

Understanding Unsealed Roads

An unsealed road is a carefully balanced material system.

It is not simply "dirt".

A functioning haul road contains a mixture of particle sizes.

Particle Type	Role
Coarse aggregate	load bearing
Intermediate particles	structural stability
Clay and fines	binding agent

The fine fraction is critical.

Without fines, the aggregate becomes loose.

When fines leave the surface, the road begins to degrade.

What Creates Dust?

Dust is generated when the fine fraction becomes mobile.

Three mechanisms cause this.

Mechanical disturbance

Vehicle tyres shear the road surface and dislodge particles.

Wind erosion

Loose dry fines are lifted by air movement.

Surface drying

As moisture leaves the road, natural binding forces weaken.

DUST SCIENCE...

Why Water Alone Fails...

Water suppresses dust only temporarily.

Water adds moisture but does not create durable particle bonding.

When water evaporates:

- fines remain loose
- dust returns.

This leads to the familiar cycle of constant watering.

The Fines Retention Principle

The real objective of dust suppression is:

Retain the fines in the road surface.

Extreme Green Dust Suppressant achieves this by bonding fines together.



LIGNIN AND LIGNOSULFONATE CHEMISTRY

The Origin of Lignosulfonate

Wood is composed primarily of three polymers.

Component	Approximate proportion
Cellulose	40–50%
Hemicellulose	20–30%
Lignin	20–30%

Lignin acts as the natural glue that binds plant fibres together.

During paper manufacturing, lignin is separated from cellulose.

Through sulfonation, lignin becomes lignosulfonate, which is water soluble.

Polymer Characteristics

Lignosulfonate molecules are large polymer chains with multiple functional groups.

These groups enable:

- particle adsorption
- electrostatic attraction
- moisture interaction.

Industrial Uses

Lignosulfonates are used widely in:

- dust suppression
- concrete additives
- drilling fluids
- ceramics
- agriculture
- animal feed binders.

HOW EXTREME GREEN DUST SUPPRESSANT WORKS

Extreme Green Dust Suppressant suppresses dust through three interacting mechanisms:

Mechanism 1 — Wetting

Lignosulfonate reduces the surface tension of water. This allows the solution to spread across and penetrate the road surface. Better wetting ensures the product reaches the fine particles that generate dust.

Mechanism 2 — Particle Binding

Lignosulfonate molecules adsorb onto soil particles. As water evaporates, the polymer forms adhesive bridges between particles. These bridges stabilise the fines. The surface becomes more cohesive.

Mechanism 3 — Moisture Retention

Lignosulfonate attracts and retains atmospheric moisture. This slows drying of the treated surface. A slightly moist road surface produces significantly less dust.

Surface Crust Formation

After application and curing, a thin flexible crust forms at the surface. This crust locks fines into place.

Unlike brittle synthetic polymers, lignosulfonate surfaces remain flexible under traffic.

APPLICATION MODES (SURFACE VS MIX-IN)

Extreme Green Dust Suppressant can be applied in two primary ways.

Surface Treatment

Surface spraying is the most common application. Diluted product is sprayed onto the road surface using a water cart or spray truck. The solution penetrates the upper soil layer. As it dries, the lignosulfonate bonds the fines.

Typical Use Cases

- operational haul roads
- temporary access roads
- construction sites
- stockpile areas
- industrial yards.



Mix-In Soil Stabilisation

Extreme Green Dust Suppressant can also be mixed into soil prior to compaction.

This technique is used during road construction or rehabilitation. The lignosulfonate binds soil particles throughout the road layer. This produces longer lasting stabilisation.

Surface vs Mix-In Comparison

Method	Duration	Cost	Complexity
Surface spray	moderate	low	simple
Mix-in stabilisation	long	higher	more complex

Most mine sites begin with surface treatment.

ROAD SUITABILITY

ROAD SUITABILITY ASSESSMENT

Before applying any dust suppressant, it is critical to determine whether the road surface is suitable for treatment.

Dust suppressants are not a substitute for correct road construction. They work best when the road has an appropriate distribution of particle sizes.

Ideal Soil Composition

Dust suppression works best when road materials contain:

Soil Component	Recommended Range
Coarse aggregate	40-60%
Sand	20-35%
Clay and fines	5-15%

Fine particles are essential because they provide the material that lignosulfonate binds together.

If the fines fraction is too low, the dust suppressant has nothing to bind.

Field Assessment Checklist

When inspecting a road prior to treatment, look for:

Signs of suitable roads

- compacted surface
- moderate fines content
- smooth surface after grading

Signs of unsuitable roads

- large loose aggregate
- deep ruts
- extremely sandy material
- heavily segregated surfaces

Dust Source Identification

Dust may originate from several areas:

- haul roads
- stockpile pads
- crusher feed roads
- access roads
- loading areas
- plant yards

Each environment may require a slightly different application approach.

APPLICATION ENGINEERING

Application engineering determines the effectiveness of the dust suppressant. Poor application often causes product failures.

Typical Application Equipment

Extreme Green Dust Suppressant can be applied using:

- water carts with spray bars
- spray trucks
- agricultural boom sprayers
- irrigation systems for large areas

Water carts are the most common application equipment on mine sites.

Spray Distribution

Uniform spray coverage is critical.

The spray system should deliver:

- even distribution across the road
- minimal streaking
- controlled flow rate

Operators should ensure spray bars are calibrated and nozzles are clean.

Application Rate Concept

Application rates are typically described in:

litres per square metre (L/m²)

Factors affecting required rate include:

- traffic intensity
- soil composition
- climate
- road condition
- dust severity.

Curing Period

After application, the treated road should ideally remain undisturbed for a short period.

During this curing period:

- water evaporates
- lignosulfonate bonds particles
- surface stabilisation develops.

Heavy traffic immediately after application may reduce effectiveness. That being said in most instances the treatment occurs almost instantly and so there is no need for long waits for curing.

CLIMATE AND TRAFFIC ADJUSTMENTS

Dust suppression performance depends strongly on environmental conditions.

Temperature

High temperatures increase evaporation rates.
In hot climates:

- higher application rates may be required
- maintenance intervals may shorten.

Rainfall

Rainfall can temporarily reduce dust.
However, heavy rainfall may dilute or wash away surface treatments.
After significant rain events, roads should be inspected and retreated if necessary.

Traffic Volume

Higher traffic loads increase abrasion of the road surface.

High traffic roads may require:

- higher initial treatment rates
- more frequent maintenance applications.

Vehicle Speed

Higher speeds generate stronger air turbulence.
This turbulence lifts more dust.
Speed management can significantly improve dust control performance.



STORAGE AND HANDLING

Extreme Green Dust Suppressant should be stored in conditions that preserve product stability.

Storage Conditions

Recommended storage conditions:

- cool shaded environment
- sealed containers
- protection from contamination.

The lignosulfonate raw material SDS notes the material is stable under normal conditions and soluble in water.

Shelf Life

Typical lignosulfonate solutions have shelf lives of 6–12 months when stored correctly.

However, storage conditions should always follow manufacturer guidance.

Transport

Because lignosulfonate solutions are typically non-hazardous and non-dangerous goods, they are relatively easy to transport compared to many industrial chemicals.

This simplifies freight logistics.

Handling

Standard industrial chemical handling practices should be followed:

- avoid contamination
- maintain sealed storage
- use appropriate transfer pumps.

ENVIRONMENTAL PERFORMANCE

Environmental performance is increasingly important in industrial chemical selection.

Biodegradability

Lignosulfonate is derived from natural lignin polymers found in wood. These polymers are biodegradable and naturally occurring.

Environmental Compatibility

Because lignosulfonate originates from plant material, it is widely considered environmentally compatible compared to many synthetic chemical alternatives.

Reduced Chemical Footprint

Dust suppression technologies vary in environmental impact. For example:

Technology	Environmental concern
Chloride salts	soil salinity
Bitumen	petroleum residues
Synthetic polymers	microplastic concerns
Lignosulfonate	bio-derived

Extreme Green Dust Suppressant offers a favourable environmental profile.

Reduced Water Consumption

Extreme Green Dust Suppressant reduces the frequency of water cart operations. This results in:

- lower water usage
- reduced fuel consumption
- lower carbon emissions from water trucks.

COMPETITOR TECHNOLOGY COMPARISON

Understanding competing dust suppression technologies is critical for positioning Extreme Green Dust Suppressant effectively.

Most dust suppression methods fall into five main categories.

1. Water

Water is the most common dust suppression method used across mining and construction sites.

Advantages

- readily available
- low upfront cost
- immediate dust suppression

Limitations

- short duration
- rapid evaporation
- constant reapplication required

Water provides temporary suppression, not stabilisation.



2. Chloride Salts

(Magnesium Chloride / Calcium Chloride)

Chloride salts suppress dust primarily through moisture attraction.

Advantages

- hygroscopic moisture retention
- relatively long-lasting effect

Limitations

- corrosive to vehicles and equipment
- soil salinity concerns
- potential environmental restrictions
- residue build-up

Many mine operators avoid chloride salts due to corrosion risk.

COMPETITOR TECHNOLOGY COMPARISON

3. Synthetic Polymer Suppressants

Synthetic polymer dust suppressants form a hardened surface crust.

Advantages

- strong surface binding
- long treatment duration

Limitations

- expensive
- brittle surfaces under heavy traffic
- difficult regrading
- environmental concerns regarding synthetic materials

4. Bitumen Emulsions

Bitumen emulsions are sometimes used for road stabilisation.

Advantages

- long-lasting
- strong surface durability

Limitations

- high cost
- complex application
- environmental concerns related to petroleum products

5. Lignosulfonate Systems

Lignosulfonate products represent one of the most balanced dust suppression technologies.

Advantages

- natural polymer binder
- biodegradable chemistry
- strong fines binding
- cost-effective
- compatible with road grading

Limitations

- requires correct application
- performance depends on soil composition



WHY ENVIROSAFE SOLUTIONS?



PURPOSE-DRIVEN MANUFACTURING. PROVEN PERFORMANCE.

Envirosafe Solutions chemicals are manufactured under licence by a 100% Indigenous-owned Australian chemical manufacturer, proudly producing high-performance chemical solutions in Perth, Western Australia.

What we manufacture:

Envirosafe Solutions produces a comprehensive range of commercial and industrial cleaning chemicals, designed for demanding, high-use environments, including:

- General purpose and hard surface cleaners
- Degreasers and workshop maintenance chemicals
- Bathroom, toilet and hygiene solutions
- Laundry powders and liquids
- Dishwashing and kitchen chemicals
- Specialised industrial and site-specific formulations

All products are developed with a strong focus on cleaning efficacy, user safety and consistency of performance, making them suitable for large-scale operations and critical environments.

Built for Commercial & Industrial Use

Envirosafe Solutions products are trusted across:

- Mining and resources operations
- Facilities management and contract cleaning
- Government and education environments
- Healthcare, hospitality and commercial kitchens
- Workshops, fleet and asset maintenance facilities

Our formulations are designed to perform in real-world conditions, supporting safety, compliance and operational efficiency.



Find out more at [Envirosafe Solutions](#)

WHY ENVIROSAFE SOLUTIONS?

PURPOSE-DRIVEN MANUFACTURING. PROVEN PERFORMANCE.

Made in WA. Backed by Systems.

Envirosafe Solutions have their products manufactured in a modern manufacturing facility in Malaga, supported by:

- Structured quality and batch control processes
- Comprehensive SDS and technical documentation
- Scalable production to meet growing national demand
- Integration with Woollahra's warehousing and logistics network

Sustainability & Circular Impact

Extreme Green Dust Suppressant is committed to reducing environmental impact through:

- Safer formulations and responsible ingredient selection
- Participation in closed-loop container reuse and recycling program
- Continuous improvement in waste reduction and operational efficiency

Envirosafe Solutions products also contribute to Indigenous education, employment pathways and community programs – delivering Progress in Every Purchase.

Why Envirosafe Solutions?

- 100% Indigenous-owned Australian manufacturer
- High-performance commercial and industrial formulations
- Made locally in Western Australia
- Scalable supply
- Purpose-led manufacturing with real impact outcomes



Find our more at [Envirosafe Solutions](#)

OPERATIONAL COSTS

Dust suppression should be evaluated based on total operational cost, not product price.

Cost Drivers of Dust

Dust generates significant hidden costs.

Equipment Wear

Fine dust accelerates wear on:

- air filters
- bearings
- hydraulic seals
- radiators.

Road Maintenance

Dust generation is often associated with road degradation.

This increases:

- grading frequency
- aggregate replacement
- labour requirements.

Water Truck Costs

Water cart operations require:

- fuel
- labour
- maintenance
- equipment depreciation.

Productivity Loss

Dust can force operators to reduce speed due to reduced visibility.

Lower speeds reduce haul efficiency.

Extreme Green Dust Suppressant Cost Advantage

By stabilising fines, Extreme Green Dust Suppressant reduces:

- watering frequency
- road maintenance
- dust-related equipment wear.

This reduces total operational costs.



TRIAL PROGRAM FRAMEWORK

The most effective way to evaluate dust suppression products is through field trials.

Step 1 – Site Assessment

Evaluate:

- road condition
- traffic volume
- soil composition
- watering frequency.

Step 2 – Test Section

Select a section of road (typically 200–500 metres).

Divide the area into:

- untreated control section
- treated section.

Step 3 – Application

Apply Extreme Green Dust Suppressant to the test section at the recommended rate.

Record:

- application rate
- dilution ratio
- weather conditions.

Step 4 – Monitoring

Over several weeks measure:

- dust generation
- watering frequency
- road condition
- operator feedback.

Step 5 – Performance Evaluation

Compare treated and untreated sections.

Evaluate improvements in:

- visibility
- dust levels
- watering requirements.



OPERATIONAL SOP AND TRAINING GUIDE

Successful dust suppression programs require correct operational procedures.

Pre-Application Checklist

Before applying Extreme Green Dust Suppressant:

1. inspect road surface
2. confirm spray equipment calibration
3. ensure product dilution is correct.

Application Procedure

1. pre-grade road if required
2. apply Extreme Green Dust Suppressant evenly using spray bars
3. allow short curing period
4. monitor treated surface.

Post-Application Monitoring

Operators should monitor:

- dust levels
- road stability
- traffic performance.

Maintenance treatments may be scheduled as required.





envirosafe
solutions
better, safer, cleaner, greener

EXTREME GREEN DUST SUPPRESSANT TECHNICAL DATA SHEETS



Extreme Green Dust Suppressant

Bio-derived dust suppressant & soil stabiliser

Extreme Green Dust Suppressant From Envirosafe Solutions is a bio-derived dust suppression and soil stabilisation solution designed for unsealed roads and surfaces in mining, civil construction, quarrying, and industrial operations. Formulated using lignosulfonate—a natural polymer derived from lignin in the pulp and paper industry—Extreme Green Dust Suppressant works by binding fine soil particles, retaining moisture, and stabilising the road surface. This process prevents fines from becoming airborne dust, improving road durability while reducing watering frequency, maintenance costs, and equipment wear. The result is safer operating conditions, better visibility for operators, improved environmental compliance, and a more sustainable dust control solution manufactured in Australia by a 100% Indigenous-owned chemical company.



Significant reduction in airborne dust



Lower road maintenance requirements



Improved haul road stability



Improved operator visibility and safety



Reduced water cart frequency



Reduced equipment wear from dust ingress

Environmentally Safe



Bio-derived lignosulfonate from renewable lignin. Biodegradable and lower environmental impact compared to chloride salts, bitumen emulsions or synthetic polymers. Supports circular resource use.

Performance Efficacy



Highly effective at suppressing dust by stabilising fines rather than temporarily suppressing dust like water. Proven lignosulfonate chemistry used globally for decades.

Personal Safety



Raw lignosulfonate is classified as non-hazardous and not dangerous goods. Minimal PPE required and low toxicity risk when handled according to standard industrial practices.

Transport Safety



Not classified as Dangerous Goods for road, rail, sea or air transport, which simplifies logistics, storage and site handling.



PACK SIZES:

Product	Size	Code
Extreme Green Dust Suppressant	1000L	EVS-DUSTSUP

Extreme Green Dust Suppressant

Bio-derived dust suppressant & soil stabiliser

DIRECTIONS FOR USE:

Dilution Guide (Self Diluting/ Manual Mixing)

Application	Dilution Ratio	Typical Rate (L/m ²)	Notes
Initial Application	1:4 – 1:8 dilution (Extreme Green Dust Suppressant : Water)	1.8 - 2.0 L/m ²	Heavier application rate for initial dispersment on haul roads and construction access roads.
Follow Up Applications	1:6 – 1:10 dilution	1.0 - 1.5 L/m ²	Most common application rate for mine haul roads and construction access roads to maintain fines.
Mix-In Soil Stabilisation	Product blended directly into soil during road construction or rehabilitation.	1.0 – 2.0 L/m ² equivalent	Applied into the road layer during construction or rehabilitation.

Application Method

Example Water Cart Application

A typical surface spray treatment might use:

- Dilution: 1:4 to 1:10 with water
- Application: 1.0 - 2.0 L/m² total solution
- Coverage:
 - 1,000 L water cart covers roughly 1,200–1,600 m² depending on rate.

Practical Rule of Thumb (Mining Sites)

For haul roads:

- Initial treatment: - 1.8-2.0 L/m²
- Maintenance spray: - 1.0-1.5 L/m²

Factors That Change the Rate

Rates may increase when:

- traffic volume is high
- road fines content is low
- climate is very hot or dry
- road speeds are high
- surface is extremely dusty.

Simple operator guideline:

Initial treatment: - 1.8 L/m²
Maintenance: - 1.2 L/m²

TYPICAL APPLICATIONS:

Primarily used on:

- Unsealed haul roads
- Mine site access roads
- Civil construction roads
- Quarry roads
- Stockpile areas
- Industrial yards
- Temporary access tracks
- Bulk transport yards

Suitable for mining, civil construction, quarrying and heavy industrial operations where dust generation from unsealed surfaces is present.

Technical Data

Appearance:	Dark coloured, slightly viscous liquid
pH (neat):	5.5 - 7.5
Odour:	Mild / characteristic lignin odour
Specific Gravity @ 20°C:	1.23 - 1.25

Safe Handling & Storage Instructions

SAFETY & HANDLING

- GHS Classification
- Not classified as hazardous under Safe Work Australia GHS
- General Safety
- Avoid eye contact and prolonged skin contact
- PPE recommended during bulk or extended use
- Wash hands after use
- Refer to the Safety Data Sheet (SDS) for full safety information.

STORAGE & DISPOSAL

- Store in a cool, dry, well-ventilated area
- Keep container sealed when not in use
- Dispose of contents and container in accordance with local regulations
- Do not reuse container unless thoroughly decontaminated

TRANSPORT & REGULATORY INFORMATION

- Not classified as Dangerous Goods
- No UN number allocated
- Compliant with ADG, IMDG and IATA
- SUSMP: Not scheduled

Our Story

Envirosafe Solutions manufacturers chemicals under license from a 9001 certified, Aboriginal Owned, Chemical Manufacturer based in Malaga, Western Australia.

Envirosafe Solutions support this Aboriginal Business, our mission is to lead with passion & respect, the empowerment and growth of Indigenous People & Business' through the manufacturing of Australia's most innovative & highest quality products.

Your support in purchasing this product is directly, positively impacting Aboriginal people across Australia as we share a percentage of our sales with our traditional land owner partners or organisations that support initiatives in remote Indigenous communities.

Thankyou for your support and for helping us make a positive impact!