Unpaved Road Dust Control

Reduced and Ultralow Chloride Products

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Chloride Dust Control Properties

- **Hygroscopic** - tending to absorb moisture from the air
  - **Enhanced** – polymerically enhanced chloride solution
  - **Non-Enhanced** – chloride solution

- **Humectant** - retaining or preserving moisture
  - **Recommended** – a USDA BioPreferred liquid used in combination with water as a dust control program
Enhanced Chloride Products
Polymerically enhanced CaCl₂ or MgCl₂ Based
A family of enhanced chloride products

Non-Enhanced Chloride Product
CaCl₂ or MgCl₂

Less is More Model
- Experimentally show that enhanced chlorides remain in road and protect the environment.
These are two sections of the same road during a rainstorm. One treated with Non-enhanced, the other with Enhanced. Note the difference in surface appearance demonstrating the watershed/weather resistance of the enhanced chloride.
Road preparation prior to any application is key to successful long-term dust control.

**Keys to success:**
- Good Road Prep
  - Water
  - Good Mix in
  - Great compaction
- Enhanced Chloride Cap Application

Anyone care to guess, how many days after application?

10 Months!

Truck @ 45 MPH

No Dust
Anyone want to guess how long it has been since the reclaimer milled the road?

14 Months – August 2018
Evaporation Control yields Dust Control

Premise: Slowing the evaporation rate of water reduces the amount of water needed to control dust.

Goal: Reduction of water truck applications by 50 - 85%.

Dust Mitigation Program
Some humectant products are USDA BioPreferred\textsuperscript{1} formulations of complex organic polymers.

The Humectant coats the fine particles, adsorbs water, then creates heavier agglomerate particles.

The coated particles are tacky and group together, gaining in weight, becoming too heavy to get airborne.

\textsuperscript{1} BioPreferred Program is managed by the U.S. Department of Agriculture (USDA)
Larimer County Landfill
Ft Collins, Colorado
A Case Study

Initial application will contain a 50% Humectant and water mixture.

This can be done with your Water Truck.
Initial application will contain a 50% X-Hesion Pro and water mixture.

Or the initial application can be done by our Applicator Truck. *(preferred method).*
Every Dust Mitigation Project starts with mapping the site and with testing partners baseline dust meter measurements.

On 8/19/2014 no water had been applied prior to the dust meter measurements. Three days at 90 F, no rain, no water trucks needed.
Day 3 after application

- The Haul road has little to no dust
- However the road is Dynamic
- A water application is recommended to be followed by a maintenance application when the dust no longer falls after being airborne.
Larimer County Landfill

Year 5

Program Maintenance Application

• ESI Suggested: One 10% Humectant treatment a week maintained low dust levels

• Actual: One 20% application every five weeks maintains low dust

• How does the road look?

20 MHP
No Dust
Historically, 6 to 8 water trucks/day were used.

1-2 water trucks/day used with 1 truck/5 weeks treating with Dust Mitigation Humectant

70-80% water savings and fuel savings

Labor savings are diverted to additional tasks
Knowing that prior to the Dust Mitigation Humextant application, minimum of six truckloads of water per day were reduced to two truckloads applied, the savings to the landfill would be:

21,000 gallons (Historical, six truckloads)  
- 7000 gallons (Present, two truckloads)  
14,000 gallons x 6 days a week of dust control

= 84,000 fewer gallons of water a week

Operating 52 weeks a year and under this scenario, the landfill could see a water savings of more than 4 million gallons of water/year.

The Program at the Larimer County Landfill is a very strong example of an involved and proactive site partnering with a supplier familiar with how to manage the site variables and creating real, measurable value for the end user.