



Sources and Solutions for Windblown Dust

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Windblown Dust

From the links below, you can learn about sources of windblown dust, solutions to keep dust down, and some special cases in New Mexico where dust concentrations have been exceptionally high.



Sources of Dust

Dust storms are caused by a combination of weather conditions, the natural environment and human activities. High winds can raise large amounts of dust from areas of dry, loose, exposed soil. High winds are most common during the late winter and spring months.

Sources of dust can include the following:

- Soil disturbance during construction projects
- Disturbed land areas that are cleared and vacant
- Unpaved roads, parking lots and playgrounds
- Windblown emissions from tilled fields
- Military training exercises
- Unpaved equipment yards
- Undisturbed desert areas during the highest winds

Dust becomes much more common where natural soils have been disturbed by human activities. This tends to be concentrated close to populated areas.



Fugitive Dust Control Techniques

There are a wide variety of dust control techniques in use today, and they are specific to the source of the dust, whether it is an unpaved road, or equipment such as rock crushers, conveyors or drop points, or silos for cement. The following documents and list show the currently used and available commercial products for dust control from these sources.



Information and Guidance Documents can be found in the [Dust Control Resources Collection](#) and the [USDA Dust Mitigation Handbook](#).

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Both chemical and water based dust suppressants are commonly used by industry and include:

- Petroleum-based Emulsions
- Vegetable-based Emulsions
- Salts such as Magnesium Chloride
- Polymers
- Surfactants
- Foams for Dust Control
- Lignon Sulfonates
- Windscreens
- Fibers, Mulches and Geotextiles for Erosion Control
- Water Sprays and Dry Fog Systems
- Revegetation and Land Restoration Techniques

Dust control websites and consulting businesses can provide detailed information about these products and techniques, and what would be the most appropriate to control your dust source.

Keeping Dust Down in New Mexico

What Human-Created Sources and Activities may need Dust Control?

- Construction projects
- Work on paved or unpaved roads
- Using unpaved parking lots
- Work on vacant land or disturbed areas
- Using equipment/materials storage yards
- Agricultural operations or range management areas

Dust Control Methods:

Sprinkling/Irrigation. Sprinkling the ground surface with water until it is moist is an effective dust control method for haul roads and other traffic. This practice can be applied almost anywhere.

Vegetative Cover. In areas not expected to handle vehicle traffic, vegetative stabilization of disturbed soil is often desirable. Vegetative cover provides coverage to surface soils and slows wind velocity at the ground surface, thus reducing the potential for dust to become airborne.

Mulch. Mulching can be a quick and effective means of dust control for a recently disturbed area. Mulch can reduce wind erosion by up to 80 percent.

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Wind Breaks. Wind breaks are barriers (either natural or constructed) that reduce wind velocity and therefore reduce the possibility of suspended particles. Wind breaks can be trees or shrubs left in place during site clearing or constructed barriers such as a wind fence, snow fence, tarp curtain, hay bale, crate wall, or sediment wall. For each foot of vertical height, an 8-to 10-foot deposition zone develops on the leeward side of the barrier. The permeability of the barrier will change its effectiveness at capturing windborne sediment.

Tillage. Deep tillage in large open areas brings soil clods to the surface where they rest on top of dust, preventing it from becoming airborne. Roughening the soil can reduce soil losses by approximately 80 percent in some situations.

Stone. Stone may be an effective dust deterrent for construction roads and entrances or as mulch in areas where vegetation cannot be established. The sizes of the stone can affect the amount of erosion to take place. In areas of high wind, small stones are not as effective as 20 cm stones.

Spray-on Chemical Soil Treatments (palliatives). Examples of chemical adhesives include anionic asphalt emulsion, latex emulsion, resin-water emulsions, and calcium chloride. Chemical palliatives should be used only on mineral soils. When considering chemical application to suppress dust, consideration should be taken as to whether the chemical is biodegradable or water-soluble and what effect its application could have on the surrounding environment, including water bodies and wildlife. Effectiveness of polymer stabilization methods range from 70 percent to 90 percent, according to limited research.

Limitations

In areas where evaporation rates are high, water application to exposed soils may require near constant attention. If water is applied in excess, irrigation may create unwanted excess runoff from the site and possibly create conditions where vehicles could track mud onto public roads. Chemical applications should be used sparingly and only on mineral soils (not muck soils) because their misuse can create additional surface water pollution from runoff or contaminate ground water. Chemical applications might also present a health risk if excessive amounts are used.

Links about Dust and Dust Control

[The U.S. Environmental Protection Agency's \(EPA\) Air Quality Site](#)

[The EPA's Plain English Guide to the Clean Air Act](#)

[The U.S. Department of Agriculture's Curbing Windblown Dust](#)

[New Mexico Air Quality Index](#)

[EPA's Particle Pollution and Your Health Fact Sheet](#)