

# Guidelines for Selecting Dust Suppressants to Control Dust and Prevent Soil Erosion

## OVERVIEW

Fugitive dust is generated when vegetation is removed and soil is exposed to wind. Light winds can pick up and transport silty soils, fine sands, and clays. Course sands can also become erodible when winds are strong. Soil particles and any attached chemicals such as fertilizer and pesticides may settle out in surface waters. Airborne particles can scour leaves and tender shoots of vegetation. Clouds of dust can create a traffic hazard and impact human health.

Dust suppressants are used to minimize fugitive dust emissions and control erosion and maintenance costs on unpaved roads and lots. The mechanisms by which suppressants abate dust vary with product type; some form crusts or protective surfaces on the soil, others act as binding agents causing particles to agglomerate together, and some attract moisture to the soil particles.

Potential environmental impacts of dust suppressants include surface and groundwater quality deterioration, soil contamination, toxicity to soil and water biota, toxicity to humans during and after application, air pollution from volatile dust suppressant components, accumulation in soils, changes in hydrologic characteristics of the soils, and impacts on native flora and fauna populations.

In spite of the growing use of dust suppressants, there are no agreed upon definitions or standards of performance, and very little regulation has been passed to address dust suppressant contents, application rates, or management practices. The Department of Natural Resources and Environment (DNRE) does not have an official list of approved dust suppressants, but you must comply with the requirements listed herein.

## GROUND WATER REQUIREMENTS

The DNRE's Groundwater Program regulates discharges to groundwater under Part 31 (Water Resources Protection) of the Natural Resources and Environmental Protection Act, Public Act 451 of 1994, as amended (Act 451) and Part 22 (Groundwater Quality) Rules. Under the Part 22 Rules, there is a description of what types of materials can be used for dust suppression without having to apply for a permit. They are the following:


- (A) Water.
- (B) Calcium chloride.
- (C) Lignosulfate products.
- (D) Emulsified asphalt or resin stabilizers.
- (E) Vegetable by-products.

Substances not included on this list require a groundwater discharge permit before they can be used for dust suppression. For example, the DNRE has specific regulations and permit requirements for the application of mineral well brine as a dust suppressant. Mineral well brine is predominantly calcium chloride and provides long term dust control because it better adheres to soil particles. The regulation establishes acceptable application rates and methods, and types of areas where it can and cannot be applied. It also requires the property owner or contractor to maintain detailed record keeping




of the specific locations, amount, and source of brine applied. For more information on this general permit, go to [www.michigan.gov/deqwater](http://www.michigan.gov/deqwater), click on “Groundwater Discharge” then “Groundwater Permit Application Forms & Technical Information” and then scroll down to “Rule 2215-05-5 Oil Field Brine.”

## Potential Environmental Consequences of Dust Suppressants<sup>1</sup>



**Example Uses**

1. Unpaved roads and parking areas.
2. Harvested fields.
3. Temporary disturbed vacant land (construction sites).
4. Earth moving activities (landfills, mining).



**Exposure Pathways**

- A. Atmospheric transport and transformation.
- B. Surface runoff carrying suppressants and/or breakdown products.
- C. Uptake of dust suppressant by plants.
- D. Ingestion of dust suppressant constituents by animals.
- E. Ingestion of exposed animals by humans.
- F. Infiltration conveying suppressants to vadose zone and groundwater table.
- G. Volatilization.
- H. Occupational contact by applicators: dermally, orally or by inhalation.
- I. Potential impacts on soil microbial ecology.

**Exposure Pathways (continued)**

- J. Transport of suppressant particulates by wind erosion to unintended areas.
- K. Off-site runoff of dust suppressant and carrier solvent.
- L. Consumption of contaminated groundwater.
- M. Downwind drift of spray off-site during application.
- N. Ingestion of dust suppressant constituents by humans.

## DUST SUPPRESSANT APPLICATION PROCEDURES

- Follow the manufacturer’s specifications or other tested and approved procedures.
- The application shall be limited to the roadway, driveway or parking lot.
- Carefully monitor the application rate to ensure adequate coverage without pooling or runoff of products.
- The amount of dust suppressant applied should not exceed the minimum amount required to effectively suppress dust.
- Products must be bladed or incorporated into the road immediately upon application, to ensure the product does not migrate off the roadway.
- There should be no evidence of excess product on the roadway.
- Do not apply to paved surfaces.
- Ensure that dust suppressants do not enter and contaminate waterbodies, including surface water and groundwater. Do not allow the product to leave the roadway.
- Do not apply products to areas of roads that are subject to flooding.
- Do not apply products if precipitation is occurring, or forecast to occur before the product sets or cures.



- Improper surface preparation, incorrect application, and indifference to environmental concerns will cause public complaints that will result in close scrutiny of future dust suppression activity.
- Improper application resulting in a discharge to surface waters of the state could result in compliance or enforcement action for any potential injury to surface waters.

## **BEST MANAGEMENT PRACTICES**

The DEQ's "Guidebook of Best Management Practices for Michigan Watersheds" contains guidance on the use of dust suppressants and other measures to control dust, such as snow fencing, using mulch, and establishing vegetation. To access this document, go to [www.michigan.gov/deqwater](http://www.michigan.gov/deqwater). On the left-hand side of the page, select "Surface Water," "Nonpoint Source Pollution," and then "Technical Manuals" under "Technical Assistance."

## **CONCLUSION**

Dust suppression treatments are not permanent, and chemicals will have to be periodically reapplied. The length of time that a dust suppressant is effective varies according to type of product, soils, weather, application rate, and traffic conditions. Many manufacturers advertise that the products will be effective from 6-12 months. Some products will last up to 24 months under certain conditions.

The water quality effects of the use of dust suppressants are still not entirely known. By following these requirements and application procedures, you will not only help minimize fugitive dust, but you will also reduce the possibility of dust suppressants and sediment from entering the waterways.

### **WHERE TO GO FOR HELP**

The DNRE's Environmental Assistance Program offers free assistance to small businesses with environmental questions. Call us at (800) 662-9278 from 8:00 am to 4:00 pm Monday through Friday.

Michigan Department of Natural Resources and Environment  
Environmental Assistance Program  
P.O. Box 30457  
Lansing, MI 48909-7957

The EAP can help companies understand and comply with federal and state regulations that protect our air, water, and land.

## **REFERENCES**

1. Potential Environmental Impacts of Dust Suppressants: Avoiding Another Times Beach; Expert Panel Summary-Las Vegas, Nevada, May 30-21, 2002, Organized by the University of Nevada and U.S. EPA.
2. Michigan DEQ, Guidebook of Best Management Practices for Michigan Watersheds; Surface Water Quality Division: Lansing, Michigan, Reprinted August 2001; pp DC-1.

