

Yakima Regional Clean Air Agency Compliance Assistance Program

A Guide to Controlling Dust in Yakima County

What's inside?

- *Why Dust Is a Problem*
- *How Dust Is Regulated*
- *What Dust Control Measures to Use*
- *Advantages and Disadvantages of Dust Suppressants*
- *How to Plan in Advance to Control Dust*

Use this booklet to help assure that your business is meeting air quality laws, and to train your employees.

Why Did YRCAA Produce This Booklet?

The Yakima Regional Clean Air Agency (YRCAA) wants to help you comply with air quality regulations by increasing awareness of the requirements. The intent of this booklet is to help you understand the air quality regulations associated with dust control.

Numerous industrial processes and non-industrial activities (i.e., construction, landscaping, material handling, road and lot cleaning, etc.) create dust and nuisance. Various dust control techniques are recommended for these different activities. The following information will help you understand how you can reduce air pollution, improve your working conditions, comply with the law and avoid penalties.

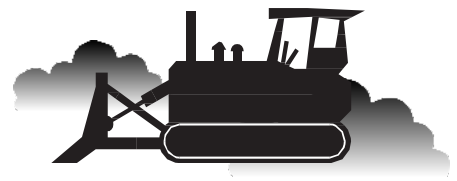
What Is Dust?

WAC 173-400 defines particulate matter as "any airborne finely divided solid or liquid material with a diameter smaller than 100 micrometers." Dust and smoke are the two major components of particulate matter.

Examples of dust include dirt, sawdust, paint overspray, and dry/powdered materials. These materials come from various sources, including, but not limited to, various industrial processes, paved and unpaved roadways, construction and demolition sites, parking lots, storage piles, handling and transfer of materials, and open areas.

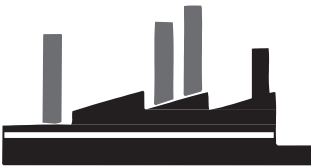
Why Is Dust A Problem In Yakima County?

The federal government has set health-based limits for six major air pollutants, including fine particulate matter less than 10 microns in diameter (PM₁₀) and less than 2.5 microns in diameter (PM_{2.5}). In the past, Yakima County has exceeded the health-based limit for PM₁₀, which when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities can reduce visibility, resulting in accidents. Dust can also be a nuisance when particulate matter is deposited on the property of others. For these reasons, YRCAA has stringent regulations which require prevention, reduction and/or mitigation of dust emissions.



YRCAA regulations require that dust emissions from industrial and non-industrial activities be controlled. The regulatory requirements include:

- Submit a Dust Control Plan, with Yakima Regional Clean Air Agency, for all commercial construction projects;
- Particulate matter emissions must be minimized;
- Deposition of particulate matter onto the property of others is prohibited;
- Precautions must be taken to prevent particulate matter from becoming airborne;
- Precautions must be taken to remove dirt and mud from equipment and vehicles before movement onto paved public roadways;
- Spills of particulate matter must be properly cleaned up;
- Dirt and mud tracked onto paved public roadways must be promptly removed.



How Is Dust From Industrial Sources Regulated?

Industrial sources that generate particulate matter are regulated through YRCAA's Registration and New Source Review programs (see YRCAA's CAP information sheets on *Registering Your Business with YRCAA* and *Obtaining a Notice of Construction Approval*). Some industrial operations that generate dust include:

- Rock crushers;
- Concrete batch plants;
- Painting operations;
- Abrasive blasting;
- Asphalt batch plants;
- Milling processes.
- Woodworking facilities;

Many of these sources operate equipment to control dust emissions. There are various types of dust control equipment used to reduce emissions from industrial processes including:

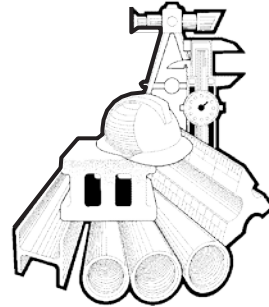
- Scrubbers;
- Baghouses;
- Cyclones;
- Electrostatic precipitators (ESPs); and
- Water nozzles.

Equipment must be properly maintained to ensure particulate collection efficiencies. YRCAA may also require self-inspections to help minimize emissions to the air.

How Is Dust From Non-Industrial Sources Regulated?

Non-industrial sources produce fugitive dust emissions. Fugitive dust emissions are defined as emissions, not passing through a stack, made airborne by wind or human activity. Fugitive sources of dust are regulated through YRCAA's dust regulations. Examples include:

- Unpaved lots;
- Private unpaved roads;
- Construction activities;
- Landscaping activities;
- Masonry activities;
- Renovation and demolition activities;
- Material storage, handling, and transportation; and
- Lot and road cleaning activities.



Fugitive dust emissions from non-industrial activities can be prevented and reduced four basic ways:

- Limiting the creation or presence of dust-sized particles;
- Reducing wind speed at ground level;
- Binding dust particles together; and
- Capturing and removing dust from its sources.

What Dust Control Measures Can Be Used To Reduce Fugitive Dust?

The table on the following page identifies applicable dust control measures for various activities. The various dust control measures are listed after the table. It is important to note that two or more dust control measures may be needed in combination to control emissions from specific activities.

| Activity | Applicable Dust Control Measures |
|---|--|
| Unpaved Roads & Lots | Paving Applying Dust Suppressants Graveling Using Water Sprays Reducing Vehicle Speed Minimizing Disrupted Surface Areas |
| Construction, Landscaping, Renovation, & Demolition | Paving Areas Early Using Water Sprays Reducing Vehicle Speed Minimizing Disrupted Surface Areas Reducing Wind Speed at Ground Level Restricting Activities During High Wind Periods Limiting Vehicle Traffic Using Chutes and Covered Dumpsters |
| Material Storage, Handling, & Transportation | Applying Dust Suppressants Using Water Sprays Using Wind Impervious Covers Minimizing Truck Load Size Cleaning Up Spills Promptly |
| Lot & Road Cleaning Activities | Using Water Sprays Using Suction/Vacuum Action on Leaf Blowers |

Dust Control Measures

Paving – Paving is a more permanent solution to dust control, suitable for longer duration projects. High cost is the major drawback to paving. Paving may be an appropriate solution for access roads to large development projects, where the road can eventually be incorporated in the overall plan for the area. Another appropriate use of paving might be "maintenance" projects, such as parking lots and staging areas, where gravel cover is not adequate for dust control or erosion. (*Note: Paving may be required for certain projects by planning and zoning codes.*)

Applying Dust Suppressants – There are many types and brands of chemical dust suppressants which work by binding lighter particles. Chemical suppressants may be applied as a surface treatment to "seal" the top of an area, or may be applied using an admix method that blends the product with the top few inches of the surface material. A list of common types of suppressants can be found later in this booklet, along with information regarding their respective advantages and disadvantages. It is important to note that **used oil** may **NOT** be used as a suppressant. RCW 70.951 specifically prohibits the use of used oil as a dust suppressant.



Graveling – Applying gravel to roads and lots adds a protective layer over the exposed soil and helps control dust generation in some situations. It is important that gravel contain a minimal percentage of fines and clean gravel be added periodically, as the fines migrate to the surface and create dust.

Using Water Sprays – Water spray, whether through a simple hose for small projects, or a water truck for large projects, is an effective way to keep dust under control. Mist systems and sprinklers are mechanisms that can be employed to deliver continuous moisture. Keep in mind, however, that fine mists should be used to control fine particulate. The size of the water droplet must be comparable to the size of the dust particle so that the dust adheres to the water.

There are several constraints to using water. Water can be very costly for larger projects in comparison to other methods. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Water used during cold months can freeze, causing equipment problems. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't become plugged.



Reducing Vehicle Speed – High vehicle speeds increase the amount of fugitive dust created from unpaved roads and lots. Reducing the speed of a vehicle from 45 to 35 miles per hour can reduce emissions by up to 22 percent, according to a Washington State Department of Ecology study. However, 15 miles per hour is recommended as the maximum vehicle speed for most conditions. Speed bumps are commonly used to ensure speed reduction. In cases where speed reduction cannot effectively reduce fugitive dust, it may be necessary to divert traffic to nearby paved areas.

Minimizing Disrupted Surface Areas – A conscious effort to disrupt only those areas absolutely necessary can provide a variety of benefits. Vegetation left in place during site work reduces the area subject to wind erosion. Minimizing the disrupted surface area also reduces the exposed area, potentially reducing the types and cost of dust control.



Paving Areas Early – Evaluating your construction schedule and site characteristics can help identify the earliest opportunity to pave the site. Efforts to pave the site before the hot, dry and/or windy seasons can minimize fugitive dust generation.

Consider opportunities to stage the site paving to minimize the amount of exposed soil at the site at any one time.

Reducing Wind Speed at Ground Level – Plants, bushes, trees, earthen banks and rock walls provide natural, and more permanent, windbreaks. Because enclosures and wind screens can be costly, the feasibility of using this type of control must be determined on a case-by-case basis.

Controlling Dust in Yakima County

Restricting Activities During High Wind Periods – Rescheduling work around especially windy days potentially can be one of the least expensive and easiest dust control measures, provided work crews are not idled and/or this is a project with significant time constraints. Limited use of rescheduling might be appropriate in extreme weather conditions, given the availability of other tasks for employees.

The high visibility of certain projects and population impacted should be taken into consideration when scheduling dust producing work. Evenings and weekends are possible alternatives for scheduling work in business and school locations; while mid-day may be more appropriate for residential areas because people are more likely to be away from home.

Limiting Vehicle Traffic – Vehicle traffic over non-paved areas can be a source of significant dust. Staging areas can be set up to limit the distance vehicles must travel over non-paved surfaces.

Using Chutes and Covered Dumpsters – When removing dusty materials from buildings, use chutes to transport the materials from the buildings to the dumpsters, and keep the dumpsters covered.

Using Wind Impervious Covers – Fabrics and plastics for covering piles of soils and debris is an effective means to reduce fugitive dust. However, these materials can be costly and are subject to degradation from the sun, weather, and human contact.

Straw and hay can also be used to cover exposed soil areas, although they can be

Minimizing Truck Load Size – Adequate freeboard on haul trucks reduces disturbance and dust emissions. If six inches of freeboard is maintained within the bed of the truck, covering the load is not required by state law. However, covering haul trucks helps prevent soils and other materials from being dropped on roads.

Cleaning Up Spills Promptly – Spills of dirt or dusty materials must be cleaned up promptly so the spilled material does not become a source of fugitive dust. When cleaning up the spill, ensure that the clean-up process does not generate additional dust.

Using Suction/Vacuum Action on Leaf Blowers – When cleaning up lots and sidewalks use the suction/vacuum action on leaf blowers to prevent dust from becoming airborne.

What Are The Advantages And Disadvantages Of Dust Suppressants?

Chemical dust suppressants are commercially available for use on most types of emission sources. Keep in mind that most of the products designed for trafficked areas are primarily intended for moderately traveled, low cost roads, typically surfaced with gravel. Dust suppression and periodic unpaved road maintenance are normally combined.



Controlling Dust in Yakima County

The performance of any dust suppressant is directly related to many factors, including:

- Application method and rate;
- Road surface moisture content during application;
- Hydrological conditions, like site precipitation and drainage;
- Mechanical stability of the road surface aggregate;
- Percent of fines in the aggregate mix; and
- The properties of the road base and subgrade.

The following table lists common dust suppressant product types and their advantages and disadvantages.

| Product Types | Performance Advantages | Performance Limitations | Environmental Consideration |
|--|---|--|--|
| Freshwater | Usually readily available, low material cost, easy to apply. | Frequent light applications may be necessary during hot, dry weather; therefore, potentially labor intensive. Over application may result in loss of traction, erosion, or points of road failure. | Minimal environmental hazard. If applied excessively, may result in tracking onto paved roadways requiring prompt clean up. Supply may be limited in some areas. |
| Calcium chloride Magnesium chloride | Reduces evaporation rate of surface moisture; lowers freezing point of water, minimizing frost heave and reducing freeze-thaw cycles; increases compacted density of road material; effectiveness retained after reblading. | Effectiveness in arid and semi-arid regions may be limited due to low relative humidity; can be corrosive to aluminum alloys and steel. Solubility results in leaching during heavy precipitation. | Repeated applications and long-term use may harm adjacent and nearby vegetation. |
| Lignin derivatives | Greatly increases dry strength of soil; not humidity-dependent; imparts some plasticity to road surfaces; lowers freezing point of road surface and base, effectiveness retained after reblading. | High solubility results in leaching during heavy precipitation, corrosive to aluminum alloys due to acidity (CaCO ₃ added ingredient, can neutralize acidity). Proper aggregate mix (4-8% fines) important to performance. Becomes slippery when wet, brittle when dry. | Lignin products have a high BOD (biological oxygen demand) in aquatic systems. Spills or runoff into surface or groundwater's may create low dissolved oxygen conditions resulting in fish kills or increases in groundwater concentrations of iron, sulfur compounds, and other pollutants. |
| Tree Resin Emulsions | Low solubility after curing minimizes leaching and provides degree of surface waterproofing. Imparts some plasticity to road surfaces. High bonding strength; non-corrosive. | Requires proper weather and time to cure. No residual effectiveness after reblading. Equipment requires prompt cleanup to avoid curing of resin in hoses and pipes. | Contact dust suppressant product vendors to obtain product-specific information. |

table continued

| Product Types: | Performance Advantages | Performance Limitations | Environmental Consideration |
|-----------------------------|--|--|---|
| Synthetic Polymer Emulsions | Applicable to a range of emission sources; functions well in sandy soil conditions. Some types allow seeded vegetation to grow through the polymer matrix. | Requires proper weather conditions and time to cure, may be subject to UV (sunlight) degradation; application equipment requires timely cleaning; no residual effectiveness after reblading. | Contact dust suppressant product vendors to obtain product-specific information. |
| Bitumens, Tars, and Resins | Water insoluble when dry; provides a degree of surface waterproofing. Good residual effectiveness. | Surface crusting, fracturing and potholing may develop; long-term application may cause road to become too hard for reblading; won't lower freezing point; petroleum oil products lack adhesive characteristics. | Use of used oils is prohibited. Some petroleum-based products may contain carcinogenic polycyclic aromatic hydrocarbons (PAHs). |
| Geotextiles | Flexible, durable, water permeable, and resists soil chemicals; reduces amount of aggregate required during initial construction; lower maintenance costs. | High material cost; material degrades in sunlight, if exposed. | None |

Adapted from "Techniques for Dust Prevention and Suppression," WA Dept. of Ecology Publication No. 96-433 (no longer updated/available.)

How Can I Plan In Advance To Control Dust?

A Dust Control Plan is one effective planning tool. At a minimum, a complete Dust Control Plan should include:

- Identification of all fugitive dust sources;
- A description of the dust control method(s) to be used for each source;
- A schedule, rate of application, calculations or some other means of identifying how often, how much or when the control method is to be used;
- Provisions for monitoring and record-keeping;
- A contingency plan in case the first control plan does not work or is insufficient; and
- The name and phone number of the person responsible for making sure the plan is implemented and who can be contacted in the event of a dust complaint.



YRCAA has developed policy which contains guidelines for controlling dust from construction related activities. To view the entire document [click here](#). You may also consult with a YRCAA representative by calling 834-2050.

Another effective dust control tool is a simple inspection checklist to make the tasks of fugitive dust control more routine. A checklist system reduces paperwork, acts as a job reminder, and serves as a record of efforts to minimize dust problems. Categories that might be included in the checklist are:

- Date;
- Time;
- Preventative measures;
- Frequency of control measures application;
- Application rates or quantities;
- Weather conditions; and
- Comments

Where Else Can I Find Information On Controlling Dust?

There are a variety of resources available that will help you learn about more ways to reduce air emissions and reduce environmental problems.

Industry Associations

Assistance from industry associations may help your business to comply with regulatory requirements associated with dust control and identify new techniques to help you stay competitive.

Associated General Contractors of Washington Education Foundation

1200 Westlake Ave North
Seattle, WA 98109
(206) 284-4500
fax: (206) 284-4595
<http://www.agcwa.com>

Central Washington Home Builders Association

3301 W Nob Hill Blvd
Yakima, WA 98902
(509) 454-4006
<http://www.cwhba.org/>

Agency Assistance

A variety of non-regulatory assistance is available from YRCAA for small businesses with air quality questions. The purpose of these programs is to:

- Explain the air quality rules and recommend ways to comply;
- Provide free, on-site technical assistance visits;
- Help businesses estimate their air pollution emissions;
- Refer businesses to needed resources; and
- Provide information on potential sources of financing for compliance requirements.

Washington Department of Ecology Central Regional Office

15 W Yakima Ave. Suite 200

Yakima, WA 98902

(509) 575-2490

<http://www.ecy.wa.gov/>**U.S. Environmental Protection Agency, Region 10**

1200 Sixth Avenue

Seattle, WA 98101

(206) 553-1200

<http://www.epa.gov>**Available Documents**

Numerous documents are available that may help your business control dust. The following documents can be obtained by calling the indicated resource and referencing the document information.

Guide to Handling Fugitive Dust from Construction Projects. Associated General Contractors of Washington. 1998. Call (206) 284-4500 to request a copy.

Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures. United States Environmental Protection Agency. 1992. Document number EPA-450/2-92-004. Call 1-800-553-6847 to order. There is a charge.

