**NATURAL RESOURCES CONSERVATION SERVICE**
**CONSERVATION PRACTICE STANDARD**

# DUST CONTROL FROM ANIMAL ACTIVITY ON OPEN LOT SURFACES

**(Ac.)**
**Code 375**

## DEFINITION

Reducing or preventing the emissions of particulate matter arising from animal activity on open lot surfaces at animal feeding operations.

## PURPOSES

- To improve air quality by addressing the air quality resource concern for particulate matter (PM), including inhalable coarse PM (identified as PM10) and fine PM (identified as PM2.5), by mitigating direct emissions of particulate matter caused by animal activity.
- To improve animal health by reducing impacts caused by inhalation of emitted particulate matter.

## CONDITIONS WHERE PRACTICE APPLIES

This practice applies to any open lot surface (open lot area, holding pen, corral, high intensity areas, working alley or other fugitive source of particulate emissions) that may be subject to animal activity at animal feeding operations (AFOs).

## CRITERIA

### General Criteria Applicable To All Purposes

**Laws and regulations**. Plan work to comply with all Federal, state, and local laws, rules, and regulations

Evaluate and avoid or minimize impact to cultural resources, wetlands and Federal and state protected species to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

Prior to installation of this practice, incorporate a dust prevention and control strategy for mitigating dust emissions from animal activity on open lot surfaces into the site conservation plan.

All open lots shall be managed to prevent surface or ground water degradation.

### Specific Criteria for Manure Harvesting

When manure harvesting is a planned activity for mitigating dust emissions from animal activity on open lot surfaces, incorporate a manure harvesting section into the site conservation plan.

Remove manure from open lot surfaces at least once a year (manure cleanout). Additionally, conduct more frequent manure harvesting according to the schedule identified in the manure harvesting section of the site conservation plan.

### Specific Criteria for Water Application

Design water application systems for the control of particulate matter to meet the applicable design

criteria in Florida NRCS conservation practice standard Sprinkler System, Code 442.

The criteria for the design of components not specifically addressed in NRCS practice standards shall be consistent with sound engineering principles.

For irregularly-shaped areas that are impractical to treat with a sprinkler system and where potential dust sources may occur, apply water with tanker trucks or trailers equipped with hoses or nozzles designed to apply water at rates and amounts similar to an equivalent sprinkler system.

The water supply of the animal feeding operation shall be adequate and available to meet other operating needs during sprinkler system operation. If temporary water storage is required to meet the flow rate required for proper sprinkler operation, such storage shall meet the applicable design criteria in Florida NRCS conservation practice standard Irrigation Reservoir, Code 436.

**Water Quality.** The quality of water applied through the dust control sprinkler system shall be suitable for animal consumption.

**Design Application Rate.** Maximum sprinkler application rates and amounts shall not result in excessive runoff or ponding on open lot surfaces.

**Pipelines.** Design water application system main lines and laterals to meet the applicable design criteria in either Florida NRCS conservation practice standard Irrigation Pipeline, Code 430.

**Pump and Power Unit.** Where required, pump and power units shall be adequate to efficiently operate the water application system at design capacities and pressures. Design pumping plants to meet the applicable design criteria in Florida NRCS conservation practice standard, Pumping Plant, Code 533.

**Electrical Components.** All electrical components, including wiring, boxes, and connectors, shall meet the requirements of the National Electric Code.

## CONSIDERATIONS

Some sites may require an approach that utilizes a combination of measures for dust control. For example, manure harvesting can reduce water application demand as there is less organic material (OM) on the open lot surface. Less OM would require less water to increase the moisture content of the surface material.

Pull-type manure harvesting equipment, such as a box scraper, will allow for a more even, smooth surface than push-type manure equipment, such as a front-end loader. A more even, smooth surface is preferable to allow for proper moisture management in the open lot surface.

Surface shaping and smoothing of animal holding areas may be applied to prevent water ponding and chronic wet areas. Water ponding and chronic wet areas can increase emissions of other air pollutants, such as ammonia, volatile organic compounds (VOCs), odorous sulfur compounds, methane, and nitrous oxide.

Avoid excessive sprinkler overlap to minimize runoff and wet areas and to reduce odor and fly problems. In order to minimize the potential for odor emissions while also reducing dust emissions, maintain moisture content in the open lot surface between 25-40%.

In areas where the water supply is limited or under water restrictions, water applications can be more efficient if applied in late afternoon, which is just prior to the normal time for significant animal activity and weather conditions that would typically contribute to dust impacts.

To improve the efficiency of dust mitigation efforts, conduct manure harvesting and/or water application with consideration of forecasted or anticipated weather conditions. For example, it may be beneficial to conduct water applications prior to a forecasted wind event to minimize the potential for entrainment of particulate matter by the wind.

The installation of a water meter to measure water usage is recommended for proper management.

For animal facilities where it is practical to grow vegetative cover, consider the use of Florida NRCS conservation practice standard Critical Area Planting, Code 342 or Florida NRCS conservation practice standard Heavy Use Area Protection, Code 561 to establish vegetation or protect the surface from damage from animals and reduce fugitive dust generated from animal use of the area.

Florida NRCS conservation practice standard Mulching, Code 484 may also be used with or without the establishment of vegetative cover to reduce fugitive dust generated from animal activity.

Consider the use of barriers placed at right angles to prevailing wind currents at intervals of about 15 times the barrier height. Windbreaks, shelterbelts, solid fences, snow fences, burlap fences, crate walls, bales of hay, tire bales, and similar material can be used to control air currents and blown soil. For detailed Windbreak/Shelterbelt criteria, see Florida NRCS conservation practice standard Windbreak/Shelterbelt Establishment, Code 380.

For areas that are not subject to animal activity, additional practices, such as applying mulch [Florida NRCS conservation practice standard Mulching, Code 484], establishing vegetation [Florida NRCS conservation practice standard Critical Area Planting, Code 342,or Florida NRCS conservation practice standard Heavy Use Area Protection, Code 561], use of environmentally acceptable dust suppressants [Florida NRCS conservation practice standard Dust Control on Unpaved Roads and Surfaces, Code 373], and the use of wind barriers [Florida NRCS conservation practice standard Windbreak/Shelterbelt Establishment, Code 380] may be applied to provide additional fugitive dust control.

## PLANS AND SPECIFICATIONS

Prepare plans and specifications for applying this practice for each area and record using approved practice specifications, job sheets, or other acceptable documentation with narrative statements that describe the site specific details of the installation.

Prepare the plans and specifications to include the following minimum information:

1. Location and extent where the practice will be applied.
2. Identification and description of the type and amount of material being used for dust control, and method of application.
3. Specifications on grading requirements.
4. Plans for any re-applications of materials.
5. Identification of any adjacent sensitive areas (e.g. fish spawning areas and nearby water bodies).
6. List of criteria to follow during application.
7. List of items to consider during application.

## OPERATION AND MAINTENANCE

Record the following activities and weather information:

- daily precipitation,
- manure removal quantities and dates for manure harvesting,
- water dates and times for dust control sprinklers.

Conduct annual self-inspection of dust control activities and add the findings to the dust prevention and control plan.

Make changes to the dust prevention and control strategy for mitigating dust emissions from animal activity on open lot surfaces in the site conservation plan as necessary.

Include in the operation and maintenance plan specific instructions for operating and maintaining the dust control water application system to ensure that it functions properly. It should also provide information regarding periodic inspections and prompt repair or replacement of damaged components.

Modifications to activities and use of measures are allowed temporarily to accommodate emergency-level contingencies such as wildfire, hurricane, drought, or flood as long as resource conditions are maintained

## REFERENCES

Auvermann, Brent, David Parker, and John Sweeten, 2000. Manure Harvesting Frequency – The Key to Feedyard Dust Control in a Summer Drought, Extension Service Publication E-52. Texas AgriLife Extension Service.

Florida NRCS Conservation Practices Standards
- Critical Area Planting, Code 342
- Dust Control on Unpaved roads and Surfaces, Code 373
- Heavy Use Area Protection, Code 561
- Irrigation Pipeline, Code 4300
- Irrigation Reservoir, Code 436
- Sprinkler System, Code 442
- Mulching, Code 484
- Pipeline, Code 516
- Pumping Plant, Code 533
- Windbreak/Shelterbelt Establishment, Code 380

General Manual
- Title 420-Part 401

Title 450-Part401
Title 190-Parts410.22 and 410.26

Livestock and Poultry Environmental Stewardship Curriculum Lesson 42: Controlling Dust and Odor from Open Lot Livestock Facilities.

Mukhtar, Saqib and Brent Auvermann. 2009. Improving the Air Quality of Animal Feeding Operations with Proper Facility and Manure Management, Extension Service Publication E-585. Texas AgriLife Extension Service.

National Cultural Resources Procedures Handbook

National Environmental Compliance Handbook

National Food Security Act Manual

National Planning Procedures Handbook

Rahman, Shafiqur, Saqib Mukhtar, and Ron Wiederholt. 2008. Managing Odor Nuisance and Dust from Cattle Feedlots, Extension Service Publication NM-1391. North Dakota State University Extension Service.