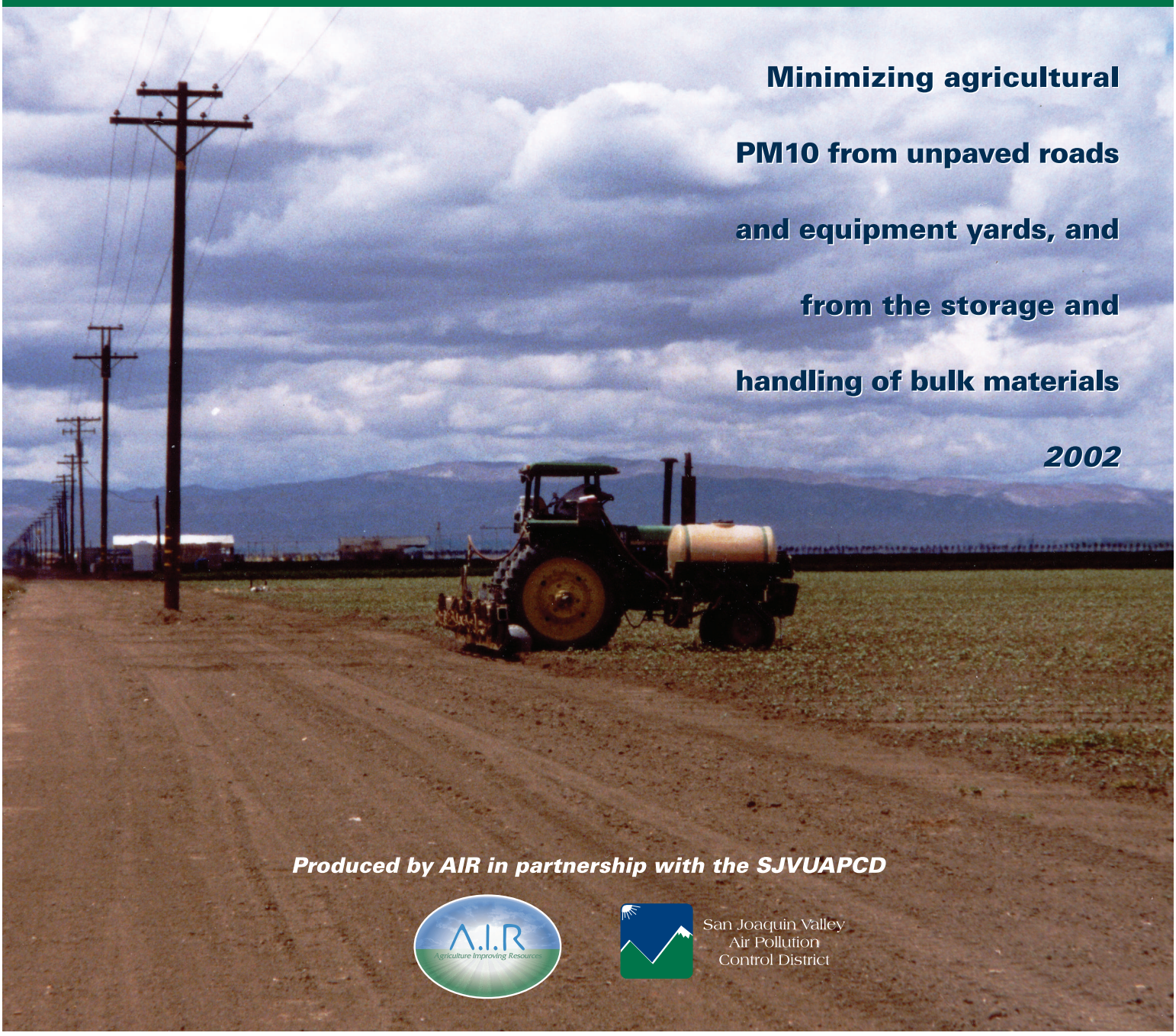
Air Quality

Conservation Management Practices for San Joaquin Valley Farms



Minimizing agricultural PM10 from unpaved roads and equipment yards, and from the storage and handling of bulk materials

2002

Produced by AIR in partnership with the SJVUAPCD

A.I.R
Agriculture Improving Resources

San Joaquin Valley
Air Pollution
Control District

for more information

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how to use this booklet

The agriculture industry prepared this booklet to provide farmers with accurate information and practical guidance for implementation of sound conservation and management practices to minimize PM10 from unpaved roads and equipment yards and from storage of bulk materials on San Joaquin Valley farms and ranches. Farmers and ranchers are encouraged to prepare PM10 Management Plans for their own operations. This booklet includes samples and actual forms farmers and ranchers can use to document their management plans.

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San Joaquin Valley Agriculture and the PM10 – Air Quality Issue

Ask anyone in the San Joaquin Valley to list the top three issues affecting this region and you're bound to get "air quality" as a response. There's no question that air quality in the San Joaquin Valley is a hot topic today, yet the reality is that the agricultural industry has been actively addressing and researching the issue for more than 10 years.

Agriculture recognizes that it may contribute to the PM10 issue – some of its practices and the nature of the industry contribute to the release of particulate matter smaller than 10 microns in diameter (or PM10) into the air. Agriculture also is committed to helping reduce its contributions so long as the science used to determine standards is sound and reasonable, and the control measures implemented are economically feasible.

Funding and Research. Since 1989 when the PM10 Advisory Committee was formed, the San Joaquin Valley's agricultural industry has helped procure more than $31 million dollars to scientifically identify the contributing sources to the Valley's air quality problem. The California Regional Particulate Matter Air Quality Study addressed urban and industrial contributions, as well as those specific to agriculture, such as crop varieties, cultural practices, soil types, variations in manufactured equipment, as well as equipment type and sizes.

Coalition Building. In its effort to research the PM10 issue, agriculture has worked with a broad-based coalition, including San Joaquin Valley counties, state and federal agencies, and other interested industries -- most notably the petroleum industry, which partnered with agriculture on this issue.

This coalition, which has evolved into Agriculture Improving Resources (AIR), has been instrumental in working with the U.S. Department of Agriculture's Air Quality Task Force to address air quality issues affecting agriculture around the country. Agriculture also is involved in developing Resource Conservation Plans to identify workable control measures to address agricultural PM10 issues.

Communication. The agricultural industry also has taken a proactive role in communicating with its members the impacts of PM10 and what farmers and landowners are doing to lessen emissions. Members of the PM10 Advisory Committee and AIR have given presentations to various industry representatives. The group also has worked with members of the media to bring its message to a wider audience. Additionally, the committee has maintained consistent and continuous communication with the regulatory agencies. Likewise, committee members continue to participate in the development of rules and voluntary incentive programs that ultimately will reduce the PM10 emissions in the San Joaquin Valley.

The Regulations. The San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) adopted Regulation VIII in 1993 and adopted several significant amendments to the regulation in 2001. Regulation VIII addresses a variety of PM10-producing activities, including some agricultural sources of fugitive dust emissions, specifically unpaved roads, unpaved traffic areas and storage of bulk materials.

The specific rules that govern the agricultural sources mentioned in this booklet are: Rule 8011--General Requirements and Rule 8081--Agricultural Sources. A complete recap of the rules and other information are available from the SJVUAPCD web site at www.valleyair.org.

Unpaved Roads Management Practices

What does the rule require?

Regulation VIII Rule 8081-Agricultural Sources requires limiting visible dust emissions (VDE) to 20 percent opacity or less from unpaved roads on days with 75 or more vehicle trips, and requires a stabilized unpaved road to be maintained on any day that 100 or more vehicle trips occur.

What do the terms mean?

Visible dust emissions (VDE) are evaluated as the degree of visibility obscured by a dust plume, expressed as percent opacity. A VDE of 50 percent would reduce the visibility of an object by one-half; a VDE of 100 percent opacity would totally obscure the view of an object.

Opacity is the amount of visibility obscured by pollution from particles in the air. Although not a direct measurement of PM10 emissions, opacity is considered by regulatory agencies as an indicator of the presence of PM10, and is used to measure the effectiveness of particulate control.

A stabilized surface of an unpaved road is intended to limit visible dust emissions to 20 percent opacity. Stabilizing methods may include chemical or organic stabilizers, road-mix or paving materials, vegetative materials or water.

The *stabilized surface* of an unpaved road is intended to provide resistance to generating dust from traffic or wind forces and is intended to limit VDE to 20 percent opacity. Methods for creating and maintaining a stabilized unpaved road may include chemical or organic stabilizers, road-mix or paving materials, vegetative materials, or water.

Vehicle trips are the frequency that pickups, trucks, cars and/or motorcycles drive on unpaved roads. One vehicle trip is counted each time a vehicle drives over a survey point in any one direction located at the most heavily traveled portion of the road segment during a 24-hour period. A round trip is counted as two vehicle trips. Implements of husbandry, such as tractors, trailers, quads, forklifts, balers and other harvesting equipment are not included in the count of vehicle trips per day.

Who must follow the rule?

This rule applies to farms with unpaved roads on days when traffic reaches 75 or more vehicle trips. This rule does not apply to farms with unpaved roads that have less than 75 vehicle trips per day.

What are farmers' options?

Farmers have the options of preparing and implementing a Fugitive PM10 Management Plan (FPMP) or meeting the VDE (opacity) and stabilization standards. The basic requirement is that the plan will result in 50 percent control of PM10 on days when traffic will reach 75 or more vehicle trips.

1.) Unpaved roads on days with 75 to 99 vehicle trips must:
Meet 20 percent opacity; **OR** Prepare and implement a Fugitive PM10 Management Plan using control measures that reduce PM10 emissions by 50 percent.

2.) Unpaved roads on days with 100 or more vehicle trips must:
Meet 20 percent opacity and stabilize the unpaved road surface using road oils, chemical dust suppressants or road mix; **OR** Prepare and implement a Fugitive PM10 Management Plan using control measures that reduce PM10 emissions by 50 percent.

A sample Fugitive PM10 Management Plan is included in this booklet. The plan can be submitted through your local Resource Conservation District or to the Regional San Joaquin Valley Resource Conservation District office. (See inside cover for addresses.) The regional RCD will verify that the plan meets the 50 percent PM10 control criteria, however the RCD has no liability for implementation of the plan. Farmers must keep a copy of the verified plan for their records.

Unpaved roads with 100 or more vehicle trips per day must meet the 20 percent opacity regulation and must stabilize the unpaved road surface using road oils, chemical dust suppressants or road mix; or prepare a Fugitive PM10 Management Plan using control measures that reduce PM10 emissions by 50 percent.

Methods to reduce PM10 from unpaved roads

Farmers can help reduce PM10 emissions from unpaved roads using a variety of products:

- Water Application
- Hygroscopic Suppressants (Road Salts)
- Petroleum Emulsions
- Adhesives
- Polymers emulsions
- Bituminous Materials (Road Oil)

PM10 suppressants and road surface modifications are the preferred methods for reducing PM10 emissions. A list of commonly used products is found in the pocket of this folder.

Additional control measures to limit VDE and to stabilize the unpaved road surface, such as reduced speed, restricted access to roads, gravel and vegetative materials, can help reduce PM10, but cannot be used alone to meet the required 50 percent reduction for a Fugitive PM10 Management Plan.

Consult your local USDA Natural Resources Conservation Service office for specific recommendations for products that will work for your soil type and farming operation.

Unpaved Equipment Yards Management Practices

What does the rule require?

For yards or areas one acre or larger, Regulation VIII Rule 8081-Agricultural Sources requires limiting visible dust emissions (VDE) to 20 percent opacity or less from unpaved traffic areas on days with 75 or more vehicle trips, and requires that the traffic area be stabilized on any day when 100 or more vehicle trips occur.

What do the terms mean?

Visible dust emissions (VDE) are evaluated as the degree of visibility obscured by a dust plume, expressed as percent opacity. A VDE of 50 percent would reduce the visibility of an object by one-half; a VDE of 100 percent opacity would totally obscure the view of an object.

Opacity is the amount of visibility obscured by pollution from particles in the air. Although not a direct measurement of PM10 emissions, opacity is considered by regulatory agencies as an indicator of the presence of PM10, and is used to measure the effectiveness of particulate control.

The rule applies to unpaved equipment yards of one acre or larger on days when traffic reaches 75 or more vehicle trips.

The *stabilized surface* of an unpaved traffic area is intended to provide resistance to generating dust from traffic or wind forces and is intended to limit VDE to 20 percent opacity. Methods for creating and maintaining a stabilized surface may include chemical or organic stabilizers, road-mix or paving materials, vegetative materials, or water.

Vehicle trips are the frequency that pickups, trucks, cars and/or motorcycles drive through unpaved equipment yards. One vehicle trip is counted each time a vehicle drives over a survey point in any one direction located at the most heavily traveled portion of the yard during a 24-hour period. A round trip over the survey point is counted as two vehicle trips. Implements of husbandry, such as tractors, trailers, quads, forklifts, balers and other harvesting equipment are not included in the count of vehicle trips per day.

Who must follow the rule?

This rule applies to farms with unpaved equipment yards of one acre (or larger) in size on days when traffic reaches 75 or more vehicle trips. This rule does not apply to farms with unpaved equipment yards under one acre in size, or to any size yard with less than 75 vehicle trips per day.

What are farmers' options?

Farmers have the options of preparing and implementing a Fugitive PM10 Management Plan or meeting the VDE (opacity) and stabilization standards. The basic requirement is that the plan will result in 50 percent control of PM10 on days when traffic will reach 75 or more vehicle trips.

1.) Unpaved equipment yards on days with 75 to 99 vehicle trips must: Meet 20 percent opacity; **OR** Prepare and implement a Fugitive PM10 Management Plan using control measures that reduce PM10 emissions by 50 percent.

2.) Unpaved equipment yards on days with 100 or more vehicle trips must: Meet 20 percent opacity and stabilize the unpaved traffic area using road oils, chemical dust suppressants or road mix; **OR** Prepare and implement a Fugitive PM10 Management Plan using control measures that reduce PM10 emissions by 50 percent.

PM10 suppressants and road surface modifications are the preferred methods for reducing PM10 emissions from unpaved equipment yards.

A sample Fugitive PM10 Management Plan is included in this booklet. The plan can be submitted through your local Resource Conservation District or to the Regional San Joaquin Valley Resource Conservation District office. (See inside cover for addresses.) The regional RCD will verify that the plan meets the 50 percent PM10 control criteria; however, the RCD has no liability for implementation of the plan. Farmers must keep a copy of the verified plan for their records.

Methods to reduce PM10 from unpaved equipment yards

Farmers can help reduce PM10 emissions on unpaved equipment yards using a variety of products:

- Water Application
- Hygroscopic Suppressants (Road Salts)
- Petroleum Emulsions
- Adhesives
- Polymers emulsions
- Bituminous Materials (Road Oil)

PM10 suppressants and road surface modifications are the preferred methods for reducing PM10 emissions. A list of commonly used products is found in the pocket of this folder.

Additional control measures to limit VDE and to stabilize the unpaved traffic area, such as reduced speed, restricted access to yards, gravel and vegetative materials, can help reduce PM10, but cannot be used alone to meet the required 50 percent reduction for a Fugitive PM10 Management Plan.

Consult your local USDA Natural Resources Conservation Service office for specific recommendations for products that will work for your soil type and farming operation.

Bulk Materials Storage Management Practices

What does the rule require?

Regulation VIII Rule 8081-Agricultural Sources requires limiting visible dust emissions (VDE) to 20 percent opacity or less from the outdoor handling, storage and transport of bulk materials and where applicable to maintain a stabilized surface on storage piles. Bulk materials and products are materials that have a silt content greater than five percent.

What do the terms mean?

Visible dust emissions (VDE) are evaluated as the degree of visibility obscured by a dust plume, expressed as percent opacity. A VDE of 50 percent would reduce the visibility of an object by one-half; a VDE of 100 percent opacity would totally obscure the view of an object.

Opacity is the amount of visibility obscured by pollution from particles in the air. Although not a direct measurement of PM10 emissions, opacity is considered by regulatory agencies as an indicator of the presence of PM10, and is used to measure the effectiveness of particulate control.

The rule does NOT apply to handling and/or storage of materials associated with "on-field" activities, such as compost material temporarily stored near a field prior to spreading.

The *stabilized surface* is intended to provide resistance to generating dust from wind forces, and is intended to limit VDE to 20 percent opacity. Methods for creating and maintaining a stabilized surface may include applying water or chemical or organic stabilizers. Alternatives to maintaining a stabilized surface include, covering bulk materials with tarps or other suitable materials, or constructing wind barriers.

Who must follow the rule?

This rule applies to any farm that handles or stores 100 cubic yards or more of bulk materials with a silt content greater than five percent.

This rule does not apply to:

- Bulk materials having a silt content of five percent or less.
- Any site storing less than 100 cubic yards of materials.
- Handling and storage of materials associated with "on-field" agricultural activities. Materials stored at a central storage yard at a farm site are subject to the rule.
- Any outdoor storage, handling or transport of bulk materials which would be damaged by wetting with water or by the application of chemical/organic dust suppressants, provided the owner demonstrates that no other control measure can be implemented to limit VDE to 20 percent opacity or provide a stabilized surface.
- Transport of bulk materials in an outdoor area for a distance of 12 feet or less, using a chute or conveyor device.

Methods to reduce PM10 from bulk materials storage piles

Farmers can help reduce PM10 emissions from bulk materials storage and transport by using a variety of practices, including:

1.) Wind Sheltering: Fine materials should be enclosed from the wind. To be most effective, the enclosure should be three-sided, with the open side of the enclosure located opposite from the prevailing wind direction.
2.) Watering or chemical suppressants should be applied at sufficient quantity and frequency to help prevent wind-driven PM10. *Consult your local USDA Natural Resources Conservation Service office for specific recommendations of products that will work for your operation.*
3.) Covering with tarp, plastic or other materials: Fine materials should be covered to help prevent wind-driven PM10. Covers should be anchored to prevent the wind from removing them.
4.) Limit vehicular speed while transporting bulk materials.
5.) Load all haul trucks so that the freeboard is not less than six inches when materials are transported across any paved public road sufficient to limit VDE to 20 percent opacity.
6.) Apply water to the top of the load sufficient to limit VDE to 20 percent opacity, or cover haul trucks with an anchored tarp or suitable cover.
7.) Clean the interior of the truck's cargo compartment or cover the cargo compartment before the empty truck leaves the site.
8.) Prevent spillage or loss of bulk materials from holes or other openings in the vehicle or truck cargo compartment's floor, sides and/or tailgate.

Limiting vehicle speed while transporting bulk materials is one method to help reduce PM10 from bulk materials storage piles.

Glossary of Terms

Bulk Materials: Unpackaged natural or manufactured materials products or by-products that have more than a five percent silt content.

Fugitive Dust: Dust particles that are introduced into the air through certain activities such as soil cultivation, or vehicles operating on open fields or dirt roadways.

Fugitive PM10 Management Plan (FPMP): A compliance alternative to the VDE and stabilized unpaved road surface requirements in sections 5.2.2, 5.3.1, and 5.3.2 of Rule 8081 (Agricultural Sources) of Regulation VIII governing fugitive PM10 emissions. The FPMPs include approved PM10 control measures, designed and implemented to achieve a PM10 control efficiency of at least 50 percent.

Opacity: The amount of visibility obscured by pollution from particles in the air. Although not a direct measurement of PM10 emissions, opacity is considered by regulatory agencies as an indicator of the presence of PM10, and is used to measure the effectiveness of particulate control.

PM10 (Particulate Matter less than 10 microns): A criteria air pollutant consisting of small particles with an aerodynamic diameter less than or equal to a nominal 10 microns (about 1/7 the diameter of a single human hair). Their small size allows them to make their way to the air sacs within the lungs where they may be deposited and may result in adverse health effects. PM10 also causes visibility reduction.

San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD): A special district with regulatory responsibilities for managing air quality from stationary air pollution sources within the San Joaquin Valley Air Basin. The District serves the counties of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare, and the valley portion of Kern County. The SJVUAPCD is one of 35 air districts in California.

Secondary Control Measures: Dust-suppressant materials and activities that can reduce VDE, but by themselves cannot meet the 50 percent PM10 reduction. Reduced speed on unpaved roads and restricted entry into unpaved yards and roads are considered secondary control measures.

Stabilized Unpaved Road Surface: The stabilized surface of an unpaved road or unpaved traffic area is intended to provide resistance to generating dust from traffic or wind forces and is intended to limit VDE to 20 percent opacity. Chemical or organic stabilizers, road-mix or paving materials, vegetative materials, or water can be used to create and maintain a stabilized surface.

Stabilized Surface: Any disturbed area or open bulk storage pile that is resistant to wind-blown fugitive dust emissions.

Vehicle Trips: The 24-hour total (midnight-to-midnight) count that pickups, trucks, cars and/or motorcycles drive on unpaved roads or through unpaved equipment yards. One vehicle trip is counted each time a vehicle drives over a survey point in any one direction located at the most heavily traveled portion of the road or yard during a 24-hour period. A round trip is counted as two vehicle trips. Implements of husbandry as defined in CA Vehicle Code Division 16 (Section 36000-36017), such as tractors, trailers, quads, forklifts, balers and other harvesting equipment are not included in the count of vehicle trips per day.

Visible Dust Emissions (VDE): Evaluated as the degree of visibility obscured by a dust plume, expressed as percent opacity. A VDE of 100 percent would totally obscure the view of an object.

Agriculture Improving Resources (AIR) Partners

A partnership formed to aid agriculture in promoting the voluntary improvement of air quality through scientifically proven and cost effective measures.

Almond Hullers and Processors Association
California Air Resources Board
California Apple Commission
California Association of Resource Conservation Districts
California Citrus Mutual
California Farm Bureau Federation
California Grape & Tree Fruit League
California Cotton Ginners and Growers Association
California Plant Health Association
Fresno County Farm Bureau
Kern County Farm Bureau
Kings County Farm Bureau
Madera County Farm Bureau
Merced County Farm Bureau
Nisei Farmers League
Raisin Bargaining Association
San Joaquin Valley Unified Air Pollution Control District
Stanislaus County Farm Bureau
Tulare County Farm Bureau
USDA Natural Resources Conservation Service

Industry Contributors to the PM10 study efforts

Almond Hullers and Processors Association
California Cattlemen's Association
California Cotton Ginners and Growers Association
California Farm Bureau Federation
California Fig Institute
Cotton Incorporated
Feeder Calf Association
Fresno County Farm Bureau
Independent Oil Producers Association
Kern County Farm Bureau
Kings County Farm Bureau
Madera County Farm Bureau
Merced County Farm Bureau
Nisei Farmers League
Raisin Bargaining Association
San Joaquin County Farm Bureau
Stanislaus County Farm Bureau
Sunmaid Growers of California
Tulare County Farm Bureau
Western States Petroleum Association
Western United Dairymen Association
Individual landowners and growers