



September 30th, 2018

Mr. Samir Sheikh  
Executive Director  
San Joaquin Valley Air Pollution Control District  
1990 E. Gettysburg Ave.  
Fresno, CA 93726

**RE: San Joaquin Valley Draft PM2.5 Attainment Plan**

Dear Mr. Sheikh,

On behalf of the Central Valley Air Quality Coalition (CVAQ), we present the following comments on the San Joaquin Valley Air Pollution Control District's (Air District) Draft 2018 Plan for the 1997, 2006, and 2012 National Ambient Air Quality Standards (NAAQS) for particle pollution that is 2.5 microns or smaller (PM2.5) (Draft PM2.5 Plan).

The Clean Air Act provides that each state with a region in nonattainment of federal health standards must adopt a plan for improving air quality. The Clean Air Act further requires attainment be achieved "as expeditiously as practicable." We believe the Air District's Draft PM2.5 Plan could be improved, and thus attainment practicably expedited. Our letter is separated into five sections, mirroring the five main chemical ingredients of PM2.5 in the San Joaquin Valley: combustion carbon (pages 2-15), oxides of nitrate (page 16), ammonia (page 17), dust (page 18), and oxides of sulfur (page 19). Under each section, we propose pollution-reduction recommendations intended to help our region achieve expeditious attainment. Our comments concern stationary and area sources of pollution under which the Air District has regulatory control. Comments regarding mobile sources will be directed to the California Air Resources Board (CARB), with the Air District copied.

Thank you in advance for considering our comments.

Sincerely,

*Dolores-Barajas Weller*  
Director,  
Central Valley Air Quality Coalition

*Genevieve Gale*  
Policy Associate,  
Central Valley Air Quality Coalition

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## CARBON

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Reductions to combustion carbon are CVAQ's most prioritized action for the PM2.5 Plan. According to particle speciation studies, combustion carbon will make up the largest component of the mass of a particle exceeding the 24-hour standard in Bakersfield by 2025. Furthermore, reductions of direct PM2.5 (combustion carbon and dust) are 3-7 times more effective in reducing overall PM2.5 levels than reductions to precursors of PM2.5, such as ammonia (NH<sub>3</sub>), oxides of nitrate (NO<sub>x</sub>) and oxides of sulfate (SO<sub>x</sub>) (Meeting PM2.5 Standards in the San Joaquin Valley, 2016).

In 2013, ammonium nitrate made up 51% of the mass of a particle exceeding the 24-hour standard in Bakersfield, followed by 29% combustion carbon, 9% ammonium sulfate, 9% dust and 2% elemental carbon (Meeting PM2.5 Standards in the San Joaquin Valley, 2016). In 2025, after the gains of current control programs will have materialized, it can be expected that a particle in Bakersfield exceeding the 24-hour standard will be made up of 39% combustion carbon, 37% ammonium nitrate, 13% ammonium sulfate, 7% dust, and 4% elemental carbon (Meeting PM2.5 Standards in the San Joaquin Valley, CARB, 2016).

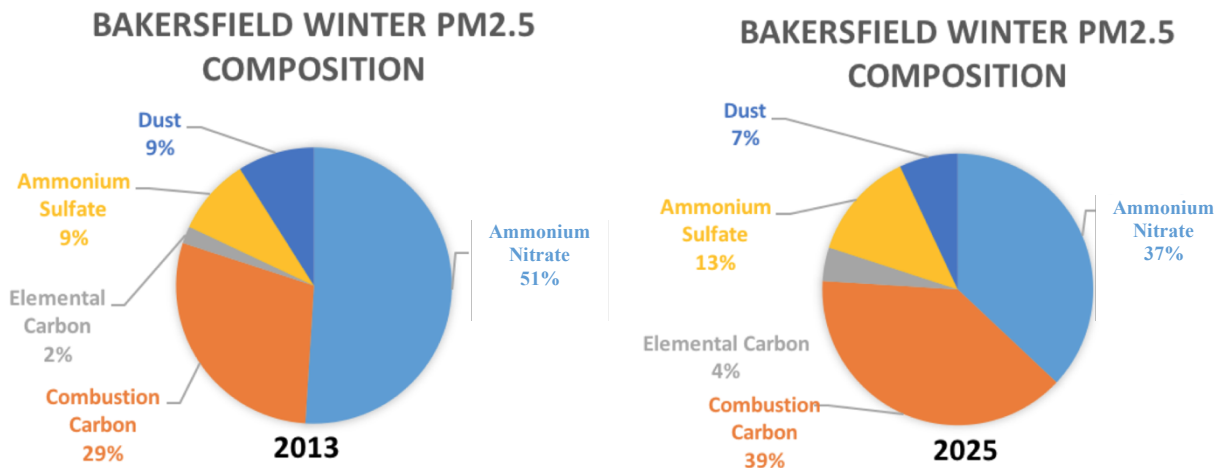


Figure 1 & 2 Source: Meeting PM2.5 Standards in the San Joaquin Valley, CARB, 2016

According to data from the joint CARB-Air District emissions inventory, in 2019 - the attainment deadline for the 2006 PM2.5 NAAQS - the largest sources of combustion carbon will come from residential burning during the winter months (8 tons per day or tpd), agricultural burning during the winter months (4.3 tpd), commercial cooking (3.9 tpd), an array of stationary sources (aggregate 8.8 tons tpd), and an array of mobile sources (aggregate 8.7 tpd). Mobile source emissions are expected to decrease 1.2 tons per day by 2025 and commercial cooking emissions are expected to increase 0.4 tons per day (Appendix B: Emissions Inventory, 2015 Plan for the 1997 PM2.5 Standard, 2015).

## SOURCES OF COMBUSTION CARBON

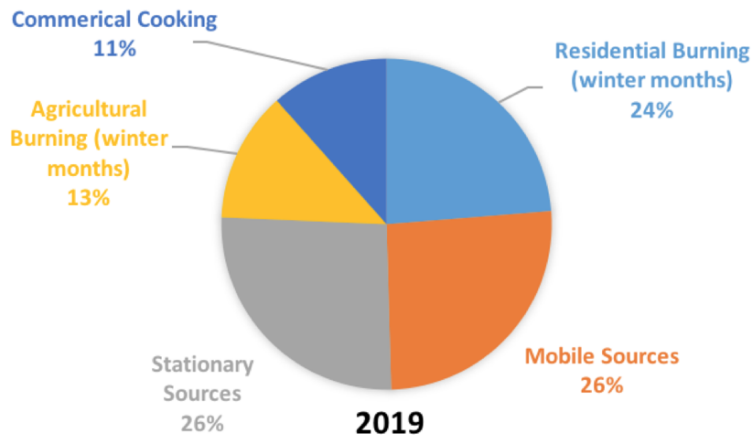


Figure 3 Source: Emissions Inventory, 2015 Plan for the 1997 PM2.5 Standard

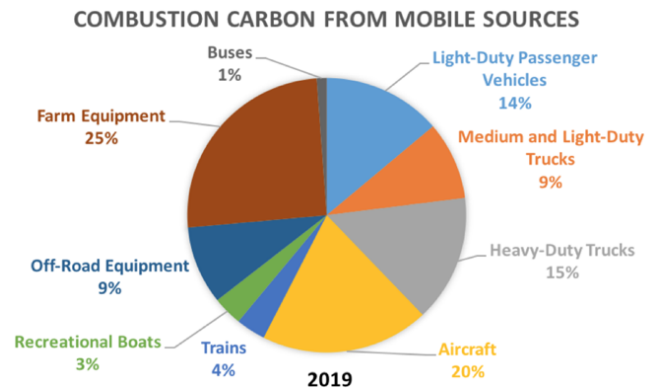
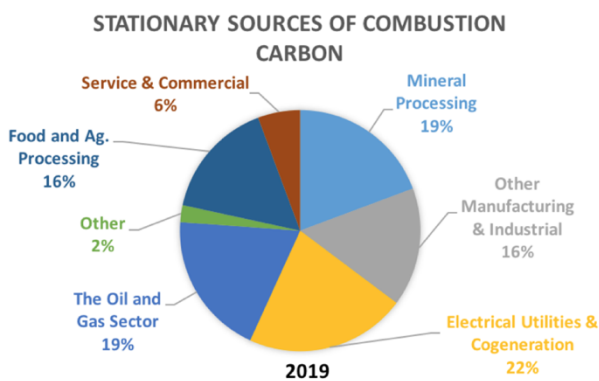


Figure 4 & 5 Source: Emissions Inventory, 2015 Plan for the 1997 PM2.5 Standard

Electrical utilities and cogeneration plants are the largest source of combustion carbon from stationary sources. Biomass incinerators, while much fewer in number than natural gas power plants, make up the majority of these emissions and are often the largest point source of direct PM2.5 in each county of the San Joaquin Valley (Facility Search Engine, CARB, 2015). The oil and gas sector is tied with the mineral processing industry as the second largest source of combustion carbon.

Fine particulate carbon from mobile sources is likely to come from the incomplete combustion of fuel. The largest mobile source is farm equipment, followed by aircraft (the combustion of jet fuel), and heavy-heavy duty diesel trucks. Light-duty passenger vehicles come in a close fourth (Almanac Emission Projection Data, 2020 Estimated Annual Average Emissions)

CVAQ believes an effective attainment strategy must focus on the largest sources of combustion carbon: residential burning, agricultural burning, commercial cooking, stationary sources (especially biomass incinerators and the emissions from the oil and gas and mining industries), and mobile sources (especially heavy-heavy duty trucks, farm equipment and off-road equipment). The following are CVAQ's proposed combustion-carbon-reduction strategies. Because this document focuses on emission sources under which the Air District has regulatory control, we will not discuss the regulation of mobile sources of emissions.

## RESIDENTIAL WOOD BURNING

Residential wood-burning in the winter months is the Valley's largest single source of carbon, and thus CVAQ's most prioritized source category to achieve reductions from.

Emissions from residential wood burning are also the #1 concern from community residents (See Appendix A). Concerns from the public have focused on the need for better enforcement of wood curtailment rules, more public education on the health impacts of wood smoke, and the need to move towards a culture of no burning in the Valley, with many asking for wood-burning to be banned altogether. Some have brought up the issue of EPA-certified wood-burning devices causing excessive smoke.

The District's current proposal responds to many of the needs expressed by the public and CVAQ. It is also the strongest piece of the District's plan in reducing direct PM<sub>2.5</sub>. We appreciate how far the District has come in controlling this source category, and we propose the following suggestions to continue down a path of continuous improvement.

### 1. Education

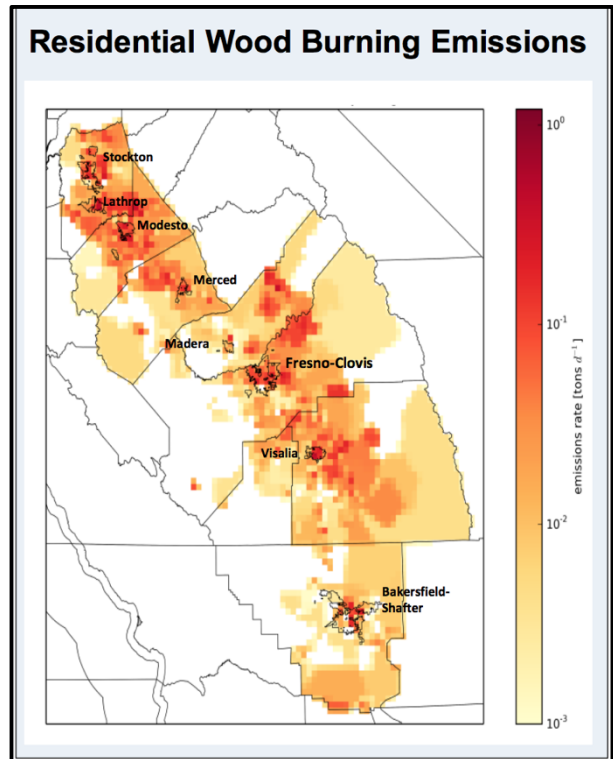


Figure 6 Source: CARB Board Meeting Presentation, 2017  
<https://www.arb.ca.gov/board/books/2017/052517/17-5-3pres.pdf>

CVAQ Request	Release a multi-pronged, multilingual advertising campaign to educate the public on the health impacts of wood smoke
District Draft Plan	Enhance outreach and education to increase awareness of residential wood burning health impacts and District's residential wood burning reduction strategy
CVAQ Comment ( <i>new</i> )	<p>We appreciate the District's plan to enhance outreach and education. We continue to suggest that this education campaign be tailored to the many cultures of the Valley and be in multiple languages. We also suggest this item be the most urgent action. In more detail, we suggest the District:</p> <ul style="list-style-type: none"> <li>Ally with community-based groups, public health communication experts and potentially a commercial marketing/advertising team that has a history of working with Latinx communities to design an</li> </ul>

	<p>education campaign on the public health impacts of wood-burning (beginning winter, 2018/19);</p> <ul style="list-style-type: none"> <li>• Conduct focus groups with different segments of the Valley's population to determine best messaging for each population; and</li> <li>• Invest in a multi-lingual and multi-pronged (billboards, radio, TV, newspaper ads, door-to-door, mailers) educational campaign based on gathered marketing information (Release Fall/Winter, 2019)</li> </ul>
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## 2. Enforcement

CVAQ Request	Increase enforcement, especially at night
District Draft Plan	Enhanced enforcement resources to assure continued high compliance rate (4-22)
CVAQ Comment ( <i>new</i> )	<p>CVAQ appreciates the District's commitment to enhance enforcement resources. We would like to see:</p> <ul style="list-style-type: none"> <li>• An action plan to address burning at night, when smoke is not clearly visible and,</li> <li>• A strategic and proactive enforcement plan, perhaps using a neighborhood-by-neighborhood approach.</li> </ul>

## 3. Incentives

CVAQ Request	Only provide incentives for natural-gas or non-portable electric heaters. Develop a program to connect low-income residents with energy-related financial resources.
District Draft Plan	<p>Enhanced levels of incentives in hot-spot areas to fund the full replacement of wood burning devices with natural gas units. Continue to offer current level of incentives Valley-wide in non-hot-spot areas. (4-21/22)</p> <ul style="list-style-type: none"> <li>• Burn Cleaner Incentive Program (3-8)</li> <li>• Burn Cleaner Wood Stove Change-out Program (3-8)</li> </ul>
CVAQ Comment ( <i>new</i> )	<p>We are incredibly supportive of the District moving to fund 100% of the cost of natural gas units. We believe this action can be taken now (Fall, 2018).</p> <p>We further suggest incentives for the rest of the Valley be only be for natural gas units. This action would help address the public concerns about smoke from EPA-certified devices.</p>

	We continue to support the District working to develop a program to connect low-income residents with energy-related financial resources.
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#### 4. Burn Threshold

CVAQ Request	Reduce burn threshold to 12 ug/m3 for all wood-fired combustion devices in the San Joaquin Valley, including EPA-certified devices.
District Draft Plan	<p>Lower curtailment levels in targeted hot spot areas (Fresno County, Kern County except Frazier Park, other areas as necessary for attainment)</p> <ul style="list-style-type: none"> <li>• No burn for non-registered units at or above 12 ug/m3</li> <li>• No burn for all devices above 35 ug/m3</li> </ul> <p>Maintain current curtailment levels in rest of the Valley</p> <ul style="list-style-type: none"> <li>• No burn for non-registered units at or above 20 ug/m3</li> <li>• No burn for all devices above 65 ug / m3</li> </ul>
CVAQ Comment ( <i>new</i> )	CVAQ continues to believe a 12-microgram threshold for the entire Valley is the most health protective, will lead to expeditious attainment, and would be easiest to enforce.

#### 5. Wood-Burning Season

CVAQ Request	Extend no-burn season timeframe to October 1 - March 31 <sup>st</sup>
District Draft Plan	During the rule evaluation process for rule amendments, District staff reviewed meteorological conditions leading to elevated PM2.5 and analyzed the feasibility of expanding the wood burning season to include October and/or March. The estimated number of increased No Burn days would have been in the range of less than one day up to six days and therefore would not significantly benefit air quality in the Valley. As such, the wood burning season was not amended to include the extra month(s). (6-5).
CVAQ Comment ( <i>new</i> )	<p>A CVAQ member has conducted an analysis of increasing the no-burn season timeframe and found it does not compare to the analysis presented by the District. Differences may be due to the year analyzed, the location selected, and the thresholds applied. Our analysis examined days in March and October of 2017 that were above present and proposed curtailment thresholds at any given location in the Valley, according to CARB's Air Quality and Meteorological Information web page (AQMIS2). We found:</p> <ul style="list-style-type: none"> <li>• March 2017 would have had 22 days above a 12µg/m3 threshold, and 13 days above the present 20µg/m3 threshold.</li> </ul>

	<ul style="list-style-type: none"> <li>October 2017 would have had 30 days above a 12µg/m<sup>3</sup> threshold and 21 days above the present 20µg/m<sup>3</sup> threshold. 4 days exceeded the 35µg/m<sup>3</sup> threshold.</li> </ul> <p>Furthermore, an analysis of the 7 last years, 2011-2017, found an average of 12 days in March and 23 days in October exceeding the proposed 12 µg/m<sup>3</sup> curtailment threshold at any location in the Valley.</p> <p>We continue to believe that increasing the no-burn season timeframe would have beneficial impacts on public health and attainment and continue to support this policy proposal. Nonetheless, the District should publish its full analysis of increasing the length of the burn season for public review.</p>
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## 6. EPA-Certified Devices

CVAQ Request	Require wood-burning devices be converted to gas or permanently disabled at the time real estate changes hands; prohibit wood-burning devices in new construction
District Draft Plan	Prohibit wood-burning devices in new construction (at higher elevations, only allow EPA-certified devices)
CVAQ Comment ( <i>new</i> )	We commend the District for prohibiting wood-burning devices in new construction; it will help combat pollution that would come from increased population. We suggest one additional step: mandating wood-burning devices, including EPA-certified devices, be converted to natural gas or permanently disabled at the time real estate changes hands.

## 7. Most Stringent Measures

CVAQ Request	Require most stringent measures for residential wood-burning.
District Draft	Current residential wood-burning rules are most stringent in the nation.
CVAQ Comment ( <i>new</i> )	The Clean Air Act requires most stringent measures (MSMs) on all emission sources in the region. A CVAQ member has compiled a list of the most stringent measures in practice in the country as they relate to residential wood-burning. We support the measures proposed (see Comment Letter from Thomas Menz) and expect the Air District to adopt and implement all MSMs.

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## *AGRICULTURAL BURNING*

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Agricultural burning (Ag Burning or Open Burning) in the winter months is the second-largest source of combustion carbon emissions in the San Joaquin Valley. Ag burning is also tied with residential burning as the #1 source of community concern (See Appendix A). CVAQ believes the Air District does not go far enough in changing the current incentive structure surrounding agricultural burning. We believe more should be done to deter burning and to promote on-farm alternatives, such as mulching, reincorporating, and composting woody waste. We provide the following recommendations.

### **1. Incentives & Fees**

CVAQ Request	Streamline and coordinate federal, state and local incentive programs for sustainable agricultural practices; Increase the cost of an agricultural burn variance to \$800 - \$1,000 an acre; Use funds from variances and other sources to provide a \$200-an-acre incentive for farmers to mulch, incorporate, and/or compost wood waste.
District Draft Plan	<p>(C-29) The District intends to (...) undertake efforts aim at the development and deployment of feasible alternative technologies and practices to reduce open agricultural burning in the Valley by pursuit of the following:</p> <ul style="list-style-type: none"><li>• Exploring the feasibility of utilizing air curtain burn boxes subject to the District's Smoke Management System safeguards as an extension of agricultural operations.</li><li>• Continued support for state and federal financial assistance to promote cleaner alternatives for the disposal of agricultural waste.</li><li>• Continued support and financial assistance as feasible for the emerging cleaner alternatives to the open burning of agricultural waste, with priority given to on- the-farm deployable (minimum or no transportation related emissions) and scalable technologies, considering the full life-cycle of emissions and associated impacts on air quality when assessing the feasibility of alternatives to open burning.</li></ul>
CVAQ Comment <i>(new)</i>	<p>We support the District's proposal to support cleaner alternatives to open burning, especially on-farm, low-emission practices. However, we are concerned that mulching and reincorporating wood waste are not included by name in the list of alternatives supported.</p> <p>We again suggest the District streamline and coordinate federal, state and local incentive program to help farmers access the funding that is available.</p>



	<p>We continue to suggest the District change the incentive structure surrounding agricultural burning. The District's abatement fees for the illegal practice of open burning is not high enough, as it does not appear to be discouraging farmers from burning woody waste. The penalty should be raised by \$200 an acre. The District should use funds collected from abatement fees and from other sources to provide a \$200-an-acre incentive directly to farmers to mulch, incorporate, and/or compost wood waste.</p>
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## 2. Technologic and Economic Feasibility of Alternatives to Open Burning

District Draft Plan	<p>The District has identified soil incorporation of woody biomass, composting, various scales of biomass-to-power technologies, and air curtain burners as potential measures which were evaluated for technological and economic feasibility of implementation in the Valley. These measures will be further discussed below. (C-26)</p> <ul style="list-style-type: none"> <li>• Composting (C-26)</li> <li>• Advanced Biomass to Power Technologies (C-26/27)</li> <li>• Air Curtain Burn Boxes (C-28)</li> </ul>
CVAQ Comment <i>(new)</i>	<p>The District's analysis of alternatives to burning on pages C-26 to C-28 appears to be incomplete. The topic sentence includes mention of mulching and soil incorporation, but the District does not include a technical or financial analysis of these practices. Perhaps this is an oversight; we look forward to this omission being corrected in the next Draft.</p>

## 3. Burn Restrictions

CVAQ Request	<p>Require agricultural burning to follow the 12 ug/m3 residential wood-burning restrictions. Do not allow burning on days during - or directly proceeding - rain events.</p>
District Draft Plan	
CVAQ Comment <i>(new)</i>	<p>It is unclear in the Draft Plan as to whether restrictions on open burning will follow the District's residential wood-burning restrictions. A more thorough explanation of the District's approach in the next iteration of the Plan will help alleviate this confusion.</p> <p>We continue to support no burning on days during or directly proceeding rain events. Wet wood cannot burn hot, and thus creates excess smoke.</p>

#### 4. Enforcement

CVAQ Request	Increase enforcement during peak PM2.5 season and during exceptional events.
District Draft Plan	
CVAQ Comment ( <i>new</i> )	Through NASA satellite imagery, CVAQ has found open burning occurring on days exceeding PM2.5 health standards. As this is not allowed by the District, we assume many of these burns to be illegal. Furthermore, through investigation into NASA imagery, illegal burns appear in the wake of wildfire smoke. The District should increase enforcement during the peak PM2.5 season and during wildfires to address this.

#### 5. Industrial Biomass Facilities

CVAQ Request	No longer offer political or economic support to the biomass industry
District Draft Plan	<p>In 2015 [...] the District requested that the Governor direct the California Public Utilities Commission to recognize the societal benefits of existing biomass facilities [...] and to extend Power Purchase Agreements with existing biomass facilities at current pricing levels (C-25).</p> <p>[...]</p> <p>Many of these facilities are located in or near disadvantaged communities and community members and advocates have been critical of the emissions from these plants being concentrated in these communities (C-25).</p>
CVAQ Comment ( <i>new</i> )	Biomass incinerators are not solutions to wood disposable, as they concentrate PM2.5 emissions in already overburdened communities. We appreciate the District's acknowledgement of the environmental justice problem and continue to ask the District to no longer offer political or economic support to the industry.

## UNDER-FIRED CHARBROILERS

Emissions from commercial cooking are the third-largest source of combustion carbon in the Valley. Emissions are concentrated in urban areas, especially around the cities of Stockton, Modesto, Fresno and Bakersfield. Emissions are expected to increase as population grows (Emissions Inventory, 2015). CVAQ commends the District for pursuing reductions from under-fired charbroilers through a combination of incentive and regulatory measures. Our remaining concern relates to the District's hot-spot approach. Because Stockton and Modesto experience a similar amount of pollution from commercial cooking as Fresno and Bakersfield, we believe they should not be left out of the PM<sub>2.5</sub> Plan. Including these cities and other areas impacted by cooking emissions would expedite attainment of our federal health standards.

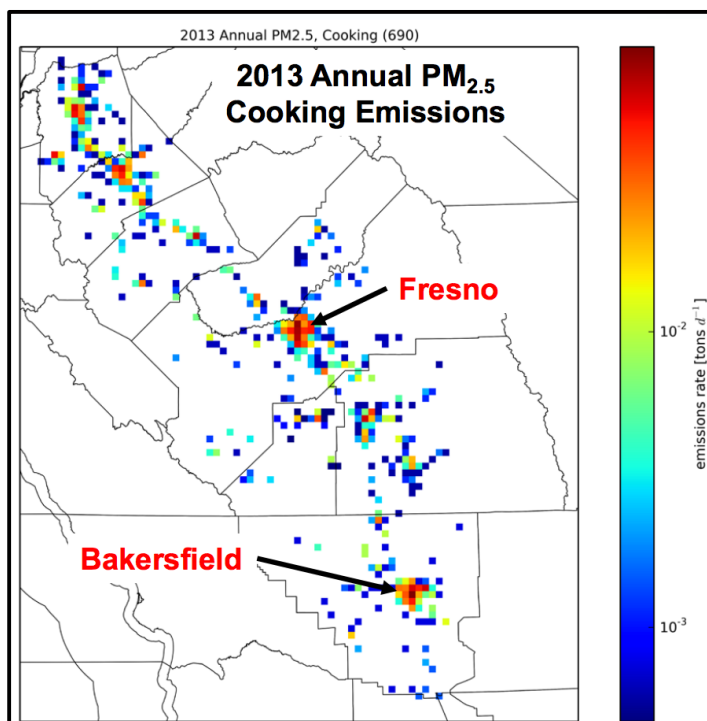


Figure 7 Source: CARB Board Meeting Presentation, 2017  
<https://www.arb.ca.gov/board/books/2017/052517/17-5-3pres.pdf>

### 1. Incentives

CVAQ Request	Increase outreach and incentives for pollution control devices
District Draft Plan	The District will [...] fund the installation of controls for commercial under-fired charbroilers within urban boundaries of hotspot areas (4-19)
CVAQ Comment ( <i>new</i> )	We support the District's increased incentives and suggest the District provide incentives to all large restaurants in the Valley, not just those in hot-spot areas.

### 2. Regulations

CVAQ Request	Require large under-fired charbroilers to install pollution control devices by 2024. Require pollution control devices on all new under-fired charbroilers.
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District Draft Plan	<p>The District will [...] fund the installation of controls for commercial under fired charbroilers within urban boundaries in hotspot areas with a 2024 regulatory requirement (4-19)</p> <p>Require installation of control technologies at new larger restaurants within urban boundaries of hot-spot areas supplemented by incentives as feasible (4-19)</p>
CVAQ Comment <i>(new)</i>	<p>We support the District’s proposed regulatory backstop. However, we believe:</p> <ol style="list-style-type: none"> <li>1) The 2024 regulatory backstop should apply to large restaurants in all urban areas of the Valley, and</li> <li>2) Existing pollution control devices should be considered Best Available Control Technology (BACT) and thus mandated at all new large restaurants across the Valley, not just at restaurants in the hot-spot areas.</li> </ol>

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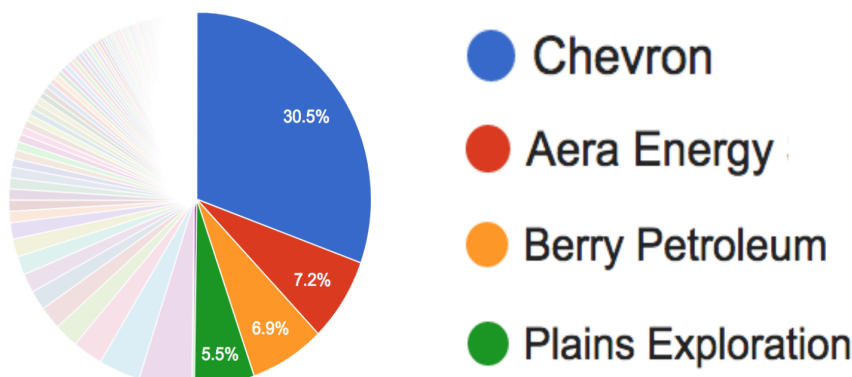
## OIL & GAS

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The aggregate emissions from point sources of pollution on oil and gas fields amount to the second-largest source of combustion carbon emissions within the stationary source category (Emissions Inventory, 2015).

However, this statistic slightly obfuscates the true impact of oil and gas operations on air quality

**Total PM2.5 Emissions from Large Stationary Sources in the San Joaquin Valley**



*Figure 8 Source: CARB Air Pollution Mapping Tool, SJV Air Basin, 2016*

in the San Joaquin Valley. When looking at large stationary sources of pollution in the Valley (facilities that must report their emissions under CARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions), oil and gas operations dominate the field; just four corporations account for half of all PM2.5 emissions from large stationary sources (CARB Air Pollution Mapping Tool, 2016). That is more direct PM2.5 than is produced by all passenger vehicles and light and medium-duty trucks combined (Emissions Inventory, 2015). Chevron alone produces 1.5 tons of direct PM2.5 a day. That's more direct PM2.5 than is produced by all trains and aircraft combined (Emissions Inventory, 2015). Most of these facilities are located in Kern county, the most overburdened area in the San Joaquin Valley; Bakersfield is the #1 most polluted city in the nation (American Lung Association, 2017).

Unfortunately, pollution from the oil and gas industry is expected to worsen. Kern county expects more than 72,000 new wells and associated infrastructure over the next 25 years (Kern County Oil and Gas Ordinance). This amounts to approximately 780,000 new tons of air pollution through 2035. At such high levels, the Project will produce the lion's share of all air pollution emitted within Kern County by 2035, including 40 percent of all PM2.5 emissions county-wide and 70 percent of all nitrogen oxide (NOx) emissions (Arvin Petitioners' Opening Merits Brief, 2016). Even with mitigation, expansion like this will cause a significant, cumulative increase in air pollution. This could potentially counteract all the good work the Draft PM2.5 Plan expects to accomplish.

To attempt to address the problem, we propose the following recommendations.

### 1. Boilers and Steam Generators

CVAQ Request	Require all new oil and gas operations use solar-powered steam generators and boilers (BACT)
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District Draft Plan	<p>The District will work with affected operators to further reduce NOx emissions from boilers, steam generators, and process heaters to the extent that such controls are technologically and economically feasible. Potential measures include lowering the emission limits for the class and category and lowering the more stringent Advanced Emission Reduction Option (AERO) limit further (4-14/15)</p>
CVAQ Comment ( <i>new</i> )	<p>We applaud the District for examining lowered emission limits for a range of boilers and steam generators. The measures could achieve almost half a ton of NOx a day, which is significant. We suggest the District calculate the potential reduction in PM2.5, if any.</p> <p>For all future boilers and steam generators, we propose solar-powered units become BACT, and thus mandatory. This technology is already achieved in practice. GlassPoint of Fremont, California, has successfully deployed a concentrating solar thermal technology in the oil fields of Oman, in which troughs of mirrors are used to flash water to steam. According to the company, the solar generator has the potential to reduce emissions associated with oil production by 80 percent. Aera and GlassPoint are now working to use a large, 850-megawatt solar thermal array in the Belridge oil field near Bakersfield, California (Washington Post, 2017). The companies say this will offset 4.87 billion cubic feet of natural gas per year and avoid the emission of 376,000 tons of carbon. The Norwegian oil giant Statoil has announced plans to build solar arrays in Brazil with a clean energy industry partner, and Shell is exploring possible large solar project in Australia (Reuters, 2017; Bloomberg, 2017). We suggest the District move forward and investigate this technology, and if proven feasible, mandate it as BACT.</p>

## 2. Small Producers

CVAQ Request	<p>Include small unpermitted sources and small producers in all existing oil and gas rules.</p>
District Draft Plan	<p>Rule 4311 controls emissions from flares used in the Valley at facilities [...] Expand the applicability of the rule to apply to all sources (not limited to major sources) (4-13)</p>
CVAQ Comment ( <i>new</i> )	<p>Air District's existing rules do not limit air pollution from small equipment, well maintenance and treating operations, or "small producers". Cumulatively, these "unpermitted" and small sources are expected to emit hundreds of millions of pounds of air pollution over the coming 15 years (Arvin Petitioners' Opening Merits Brief, 2016).</p> <p>We commend the District for expanding the applicability of the flare rule to small producers. We suggest the District expand it oil and gas rules to address all sources of oil and gas pollution, including small sources.</p>

### 3. Flares

CVAQ Request	Mandate flare-minimization plans.
District Draft Plan	<p>The District will continue to work closely with affected operators and other stakeholders to undergo a regulatory amendment process for Rule 4311 to include:</p> <ul style="list-style-type: none"><li>• Additional ultra-low NOx flare emission limitations for existing and new flaring activities at Valley facilities to the extent that such controls are technologically achievable and economically feasible,</li><li>• Additional flare minimization requirements to the extent that such controls are technologically achievable and economically feasible, and</li><li>• Expand the applicability of the rule to apply to all sources (not limited to major sources)</li></ul>
CVAQ Comment ( <i>new</i> )	We thank the District for its work on flaring. We look forward to working collaboratively with the District during the rule amendment process.

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## OXIDES OF NITRATE

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Reductions to oxides of nitrate (NO<sub>x</sub>) are of significant importance for attainment. NO<sub>x</sub> combines with ammonia to create ammonium nitrate, an element that will make up 44% of PM<sub>2.5</sub>'s mass in 2019 and 37% in 2025 (Meeting PM<sub>2.5</sub> Standards in the San Joaquin Valley, 2016). In 2019, mobile sources will emit the bulk of emissions (181.2 tons of NO<sub>x</sub> per day), followed by stationary sources (30.1 tpd) and area sources (11.5 tpd) (Emissions Inventory, 2015). Heavy-Duty Diesel Trucks are by far the main, single source of emissions, making up almost 40% of NO<sub>x</sub> emissions in the Valley. However, by 2025, the mobile source sector will emit 48% less NO<sub>x</sub> and the heavy-duty diesel truck category will emit 50% less NO<sub>x</sub>.

Because NO<sub>x</sub> emissions stem primarily from mobile sources, recommendation to address these emissions will be directed to the California Air Resources Board, with the Air District copied. However, the profile of NO<sub>x</sub> from stationary sources is similar to that of combustion carbon and SO<sub>x</sub>, therefore CVAQ's recommended measures laid out in this document will address these source categories.

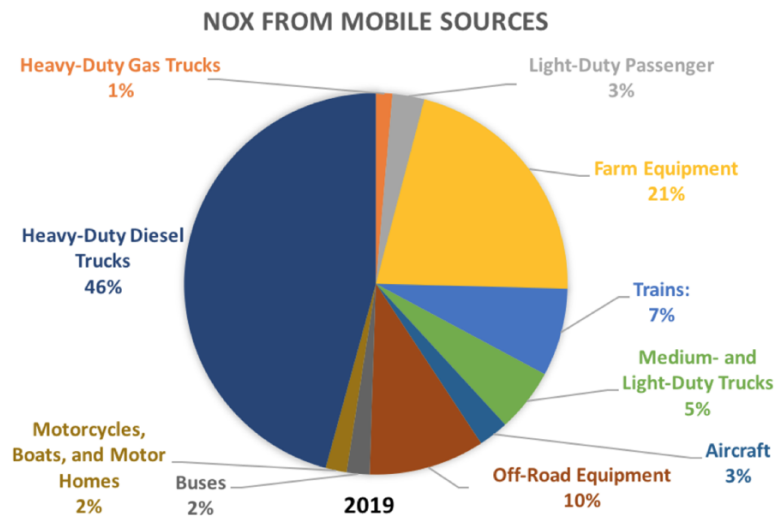


Figure 9 Source: Emissions Inventory, 2015 Plan for the 1997 PM<sub>2.5</sub> Standard

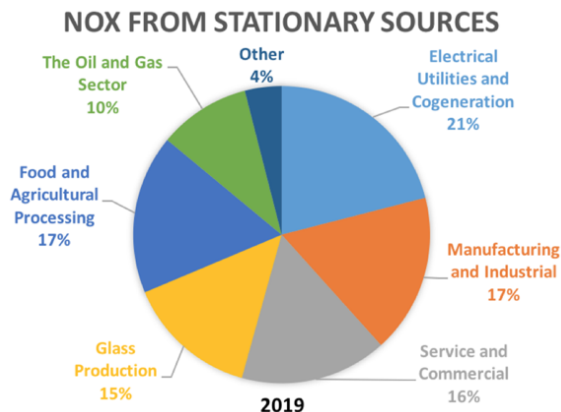


Figure 10 Source: Emissions Inventory, 2015 Plan for the 1997 PM<sub>2.5</sub> Standard



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## AMMONIA

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Ammonia combines with oxides of nitrate and oxides of sulfate to form approximately 60% of the mass of PM<sub>2.5</sub> in the San Joaquin Valley (Meeting PM<sub>2.5</sub> Standards in the San Joaquin Valley, 2016). Ammonia is therefore the most influential precursor to PM<sub>2.5</sub> in the Valley. Ammonia is also classified as a toxic air contaminant, having the potential to cause wet tissue (i.e. eyes, nose, throat) irritation and damage, corneal and skin burns/blistering, intraocular pressure (glaucoma), coughing, pulmonary and laryngeal edema, and chest pains. Furthermore, a 30% reduction to ammonia has been shown to have significant effects on overall PM<sub>2.5</sub> levels (Appendix G: Precursor Demonstration, 2018). For these reasons, it would be assumed that ammonia should be a target for reductions.

However, as NO<sub>x</sub> levels are predicted to lower over the coming decade, modeled reductions to ammonia have shown to be insignificant in reducing overall PM<sub>2.5</sub> levels (Appendix G: Precursor Demonstration, 2018). While CVAQ believes this to be important information, we also believe it should not stop the inquiry into ammonia. New evidence suggests that the NO<sub>x</sub> levels in San Joaquin Valley are significantly undercounted, perhaps by 50% (Almaraz, 2018). If this is true, ammonia reductions would have a significant impact, and Valley residents would have wished reduction were evaluated and pursued in the meantime. Furthermore, much of the predicted future NO<sub>x</sub> reductions rely on anticipated (not concrete) funding and federal actions. Therefore, CVAQ asks the District and the CARB to thoroughly evaluate the feasibility and costs of strategies to further reduce ammonia in the San Joaquin Valley, and not to give up on the ammonia question entirely.

CVAQ Request	Thoroughly evaluate the feasibility and costs of strategies to reduce ammonia.
District Draft Plan	Extensive scientific research and technical analyses demonstrate that ammonia reductions do not contribute to the Valley's PM <sub>2.5</sub> attainment (see Appendix G) and, therefore, does not need to be addressed [...] Even though ammonia is an insignificant PM <sub>2.5</sub> precursor in the Valley, the following analysis shows that the Valley's ammonia emissions have been significantly reduced through stringent regulations, that additional ammonia control measures are infeasible, and that Valley sources are already implementing BACM and MSM. (C-319)
CVAQ Comment ( <i>new</i> )	We continue to ask the agencies to thoroughly evaluate the feasibility and costs of strategies to reduce ammonia in the San Joaquin Valley, as well as assess the potential ammonia reductions that could stem from new nitrogen application rules governing farmers and new dairy digesters and alternative manure management practices being employed by dairy farmers.

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## *DUST*

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Dust makes up approximately 10-20% of the mass of a PM<sub>2.5</sub> particle in San Joaquin Valley (Meeting PM<sub>2.5</sub> Standards in the San Joaquin Valley, 2016). Dust is mostly an issue in summer and fall with contributions more local in nature. Fallow fields and drier soils in recent years have increased the dust fraction. We propose the following recommendation to address dust emissions.

CVAQ Request	Improve/add conservation management practices (CMPs).
District Draft Plan	<p>(4-17/18) The attainment modeling has demonstrated that implementation of additional CMPs will not contribute to attaining the federal PM<sub>2.5</sub> standards. However, to further develop the District's understanding of the effectiveness of CMP measures on controlling PM<sub>2.5</sub> emissions in the Valley, the District is committing to:</p> <ul style="list-style-type: none"><li>• Undertaking scientific research on the PM<sub>2.5</sub> content, constituents, and stability during wind events of the many soil types found throughout the Valley.</li><li>• Further evaluate ways to promote conservation tillage practices and to reduce windblown dust from agricultural operations to the extent that they are found to practicably reduce PM<sub>2.5</sub></li><li>• Evaluate lowering acreage applicability thresholds in order to further reduce PM<sub>2.5</sub> emissions from this source category</li><li>• Continue to collaborate with other agencies, including EPA and USDANRCS, and agricultural stakeholders to evaluate feasible opportunities to further reduce fugitive dust and emissions from agricultural operations.</li></ul>
CVAQ Comment ( <i>new</i> )	<p>We appreciate the District's commitment to exploring dust-reduction practices and measures. CVAQ plans to collaboratively engage with the District and other stakeholders on future planning efforts concerning dust and CMPs. CVAQ also supports comments regarding dust submitted by the Kern-Kaweah Chapter of the Sierra Club.</p>

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## OXIDES OF SULFATE

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Ammonium sulfate makes up approximately 10-20% of the mass of a PM<sub>2.5</sub> particles in San Joaquin Valley (Meeting PM<sub>2.5</sub> Standards in the San Joaquin Valley, 2016). Ammonium sulfate is created when oxides of sulfate (SO<sub>x</sub>) combine with ammonia, often in the summertime months. Stationary and area sources emit the most SO<sub>x</sub> (89%) and mobile sources account for the remaining 11% (Emissions Inventory, 2015). Glass manufacturing is the largest single source of SO<sub>x</sub>, producing approximately a quarter of all SO<sub>x</sub> emissions in the Valley (Meeting PM<sub>2.5</sub> Standards in the San Joaquin Valley, 2016).

CVAQ Request	Address SO <sub>x</sub> from glass manufacturing
District Draft Plan	<p>While the District meets or exceeds RACM, BACM, and MSM requirements for this source category [glass melting furnaces], given the enormity of reductions needed to demonstrate attainment with the latest PM<sub>2.5</sub> standards, the District will pursue the following potential opportunities to reduce NO<sub>x</sub> emissions for container glass furnaces to the extent that additional NO<sub>x</sub> controls are technologically and economically feasible:</p> <ul style="list-style-type: none"><li>• Evaluate feasible ultra-low-NO<sub>x</sub> control technologies (catalytic filtration, oxy-fuel combined with SCR, etc.)</li><li>• Lower NO<sub>x</sub> limit from 1.5 lb/ton to a level ranging from 1.0-1.2 lb-NO<sub>x</sub>/ton glass pulled or lower, based on a rolling 30-day average</li></ul>
CVAQ Comment ( <i>new</i> )	<p>Glass manufacturing is often the largest point source of both SO<sub>x</sub> and NO<sub>x</sub> in the Valley (CARB Air Pollution Mapping Tool, 2016). We appreciate the District's commitment to exploring opportunities to reduce NO<sub>x</sub> from glass melting furnaces. We would further advice the District explore opportunities to reduce SO<sub>x</sub> from these furnaces as well.</p>

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## WORKS CITED

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