

**SACRAMENTO METROPOLITAN  
AIR QUALITY MANAGEMENT DISTRICT**

For Agenda of **September 27, 2007**

**To:** Board of Directors  
Sacramento Metropolitan Air Quality Management District

**From:** Larry Greene, Air Pollution Control Officer  
Sacramento Metropolitan Air Quality Management District

**Subject:** New Rule 421, MANDATORY EPISODIC CURTAILMENT OF WOOD AND  
OTHER SOLID FUEL BURNING

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**Recommendations**

1. Determine that the adoption of Rule 421 is exempt from the California Environmental Quality Act (CEQA);
  2. Decide whether to include an economic hardship exemption in the rule; and
  3. Approve the attached resolution adopting Rule 421.
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**Executive Summary**

Rule 421 would prohibit wood or other solid fuel fires and use of fireplaces and wood or pellet stoves and inserts on days forecast to exceed the federal health standards. Staff estimates approximately 30 days per season may be declared no burn based on historic air quality data. Gas fireplaces and inserts would be allowed to burn. If wood or other solid fuel serves as the sole source of heat, then burning would be permitted. Solid fuel burning for cooking would also be exempt. Public opinion surveys conducted earlier this year showed that 71% of Sacramento residents support a mandatory no burn rule.

Sacramento does not meet state or federal health standards for fine particulate matter (PM2.5) air quality. Sacramento County will likely be designated nonattainment for the federal health standards for fine particles recording levels approximately 30% above the federal standards at the peak site (Del Paso Manor).

Several health studies show that fine particle pollution leads to serious health consequences including aggravated asthma, heart attacks, and premature death - shortening lives by as much as 14 years. In the Sacramento area there are 7,900 lost work days due to particle pollution, and 90 people die prematurely every year. The California Air Resources Board estimates the annual economic impacts of these health effects is \$700 million.

Residential wood burning remains one of few largely unregulated emissions sources and consequently is the single largest fine particulate emission source, contributing 49% to our wintertime pollution problems. San Joaquin Valley implemented a rule similar to Rule

421 several years ago and recorded a 30% reduction in PM 2.5 concentrations. If the same reductions can be achieved in Sacramento, significant progress can be made to attaining the standard.

Staff has presented Rule 421 at nineteen public meetings. Rule 421 was amended in response to comments received. Staff requests the Board approve Rule 421 and consider whether to include an economic hardship exemption.

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## Attachments

The table below identifies the attachments to this memo.

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## Background

Particulate matter (PM) is a mixture of very small liquid droplets and solid particles that are suspended in the air. Adverse health effects are linked to particles that are less than 10 microns in diameter (PM10), and the subset of fine particles that are less than 2.5 microns in diameter (PM2.5). According to the U.S. Environmental Protection Agency (EPA), health studies have linked exposure to PM, especially fine particles, to several significant health problems, including:

- increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing;
- decreased lung function;
- aggravated asthma;
- development of chronic bronchitis;
- irregular heartbeat;
- nonfatal heart attacks; and
- premature death in people with heart or lung disease.

Exposure to PM pollution can cause coughing, wheezing, and decreased lung function even in otherwise healthy children and adults. EPA estimates that thousands of elderly people die prematurely each year from exposure to fine particles. In addition, a recent study (Dominici et. al, 2006) of the correlation between PM2.5 concentrations and hospital admission rates concluded that short-term exposure to PM2.5 increases the risk

of hospitalization for cardiovascular and respiratory diseases.

The California Air Resources Board (CARB) has estimated both the public health and economic impacts caused by exposure to PM<sub>2.5</sub>. For the Sacramento Metropolitan Area, CARB estimates that each year:

- 90 people die prematurely;
- 20 people are admitted to hospitals;
- there are 1,200 asthma and lower respiratory symptom cases;
- there are 110 acute bronchitis cases;
- there are 7,900 lost work days;
- there are 42,000 minor restricted activity days; and
- the total economic impact of PM<sub>2.5</sub> exposure is over \$700,000,000 per year.

The 2006 emission inventory for Sacramento County shows that wood smoke accounts for 49% of wintertime PM<sub>2.5</sub> emissions. The District is currently nonattainment for the state PM<sub>10</sub> standard and PM<sub>2.5</sub> standard. Additionally, the District is not expected to meet the recently revised National Ambient Air Quality Standard (NAAQS) 24-hour standard of 35 µg/m<sup>3</sup> for PM<sub>2.5</sub>. EPA formally designates PM<sub>2.5</sub> nonattainment areas in December 2008, triggering several federal requirements to reduce PM<sub>2.5</sub> concentrations.

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## State and Federal Requirements

Sacramento County violates the state PM<sub>2.5</sub> and PM<sub>10</sub> standards and meets the federal PM<sub>10</sub> and 1997 federal PM<sub>2.5</sub> standards. EPA issued new federal PM<sub>2.5</sub> standards, which reduced the allowed 24 hour PM<sub>2.5</sub> concentration by almost half, effective December 2006. Staff expects Sacramento to be designated nonattainment for the new federal 24 hour PM<sub>2.5</sub> standards. Federal nonattainment designations are expected to be made by EPA in December 2008.

If designated nonattainment, an attainment plan must be submitted not later than 3 years after the effective date of the designation (EPA estimates this to be April 2012<sup>1</sup>). The plan must include transportation conformity budgets and control measures. Transportation conformity budgets will require that future transportation projects stay within specified emission levels that meet attainment and progress goals. Failure to do so can result in withholding federal transportation project approvals and funding.

Because of the potentially significant benefits from this rule, staff evaluated whether this rule might provide additional options to minimize or avoid impacts from federal nonattainment through: 1) an Early Action Compact or 2) reduced requirements due to early attainment.

### Early Action Compacts

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<sup>1</sup> EPA Workshop, PM<sub>2.5</sub> Implementation Rule, Chicago, Illinois, June 20, 2007

EPA approved Early Action Compacts for 33 new federal ozone nonattainment areas in 2002. Those early action compacts required a signed agreement with EPA to: 1) approve and submit local strategies designed to attain the federal standards before deadlines in the Clean Air Act, and 2) attain federal standards by prescribed dates. In exchange for these local commitments, EPA agreed to defer for a few years the formal nonattainment designation. The advantage to locals included obtaining early health benefits from local strategies and potentially avoiding the following nonattainment consequences: 1) the requirement to meet a minimum level of emission reduction to demonstrate Reasonable Further Progress, 2) imposition of RACM - Reasonably Available Control Measures (local controls would still be required but additional flexibility in selection is provided), 3) additional requirements for locating new and modifying existing industrial and commercial sources, and 4) the development of PM2.5 motor vehicle emission budgets and associated Transportation Conformity demonstrations.

EPA rules for the 1997 PM2.5 standards do not allow Early Action Compacts. Staff initiated discussions to request EPA staff establish this opportunity for the 2006 PM2.5 standards. Those 2006 standards affected 38 new nonattainment areas throughout the United States including smaller cities and a few non-urban areas. After consulting with EPA headquarters staff, EPA Region 9 staff recently indicated that they would not consider this option.

#### Early Attainment

EPA's PM2.5 implementation rule incentivizes early attainment by suspending certain planning requirements<sup>2</sup> (referred to as the "clean data policy") for areas that attain before their plans are due. The suspended requirements include some control measures and an attainment demonstration plan. The clean data policy has been challenged<sup>3</sup> in court and there is no guarantee that we can rely on this provision when the time comes.

Even if the clean data policy is overturned, early attainment will provide health benefits and could give the region additional flexibility in determining which additional measures, if any, must be included in the PM2.5 plan. If the rule does not result in Sacramento attaining the standards before April 2012, then control measures that were excluded from our original SB656 list would need to be reconsidered, and the threshold for dismissing a measure will be higher.

Requirements to limit residential burning emissions would likely be required as part of the PM2.5 federal plan. Implementation of a mandatory curtailment program is the most effective particulate control strategy that has been identified.

Proposed Rule 421 is necessary to meet the implementation schedule for District particulate matter control measures adopted by the Board on July 28, 2005 as satisfying the requirements of SB 656 (California Health and Safety Code, Section 39614). Rule 421 will limit PM emissions on poor air quality days during the late fall and winter and

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<sup>2</sup> 40CFR51.1004(c)

<sup>3</sup> American Lung Association's Nonbinding Statement of Issues, No. 07-1227 et. al., National Cattlemen's Beef Association v. Environmental Protection Agency (D.C. Circuit), July 26, 2007

assist the District in its efforts to attain the state and federal PM standards.

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## 2007 WOOD BURNING SURVEY

In an effort to gauge public awareness of fine particulate matter air quality problems and health impacts, and to gauge support and likely compliance with a curtailment program, a random telephone survey of Sacramento County residents was conducted by an independent research firm in April 2007<sup>4</sup>. The survey received responses from 499 county residents, including a subset of 139 who would be classified as low-income residents based on federal guidelines. Among the key findings are:

- 71% of all respondents would support the adoption of mandatory curtailment restrictions. Among low-income residents, the percentage was nearly identical (73%).
- 78% of respondents who burn wood indicated that they would be likely to comply with a mandatory curtailment.
- 91% of respondents who burn wood indicated that they would be likely to comply with a voluntary curtailment request. However, of those wood-burning respondents who heard this past winter's Spare The Air message, only 46% actually curtailed their wood burning.
- 59% of all respondents heard the wintertime Spare The Air requests not to burn this past winter. Among low-income residents, the percentage was 57%.
- Only 20% rated the area's air quality as poor, and only 13% rate wood smoke as a very serious cause of winter time air pollution.
- No respondents indicated wood burning as their sole source of heat.
- Ownership of at least one wood burning appliance was lower among low-income residents (34%) than among the overall population (54%).
- Among those who reduced their burning of wood last winter, 46% did so because of air quality or health concerns, or because they heard a request not to burn. Among low-income residents, the percentage who reduced their wood burning for these reasons was much lower (26.7%).
- The strongest response to suggested methods of communicating a mandatory curtailment episode was disseminating the information through news outlets, such as television and radio.

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## Summary of Proposed Rule

Rule 421 applies during the months of November through February. Rule 421 will:

1. prohibit wood and other solid fuel fires and the operation of a wood or other solid fuel burning fireplace, stove or insert when a mandatory curtailment is in effect;
2. require the Air Pollution Control Officer to declare a mandatory curtailment whenever he/she predicts the 24-hour average PM<sub>2.5</sub> concentration will exceed 35 µg/m<sup>3</sup>; and

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<sup>4</sup> The Final Report for the 2007 Wood Burn Research Study, prepared by Aurora Research Group, is included in Appendix D of the staff report.

3. specify the methods by which the Air Pollution Control Officer will notify the public of each mandatory curtailment.

Rule 421 exempts:

1. wood and other solid fuel burning for cooking purposes,
2. burning gaseous fuels,
3. wood and other solid fuel burning as an integral part of religious ceremonies,
4. use of wood and other solid fuel burning devices that are the sole source of heat, and
5. in version B of the rule, persons for whom a mandatory curtailment would create an economic hardship, subject to approval by the Air Pollution Control Officer.

Violations of the rule would result in penalties. First-time violators would pay an administrative civil penalty<sup>5</sup> of \$50, with the option to attend a wood smoke awareness course in lieu of paying the penalty fee. Penalties for subsequent violations would be determined according to the District's Mutual Settlement Program. The proposed rule includes a provision for the District's Board of Directors to approve an adjustment to the penalty fee for first-time violations as part of the annual budget process.

The Board must decide whether to include a provision (included in version B of the rule) to allow the Air Pollution Control Officer to grant exemptions from no burn requirements for economic hardships provided the granting of the exemption would not have an adverse impact. In granting or denying the request for the exemption the Air Pollution Control Officer would consider factors such as the location of the household, the monthly income and number of persons in the household, the types of fuels and heating devices in use, the monthly utility bills, the estimated amount of solid fuel to be used on a Mandatory No Burn day, and any other relevant factors. The exemption would only be valid for one season at a time and the Air Pollution Control Officer can rescind the exemption at any time if an adverse impact is identified or if he finds the information that was relied on in granting the exemption is incorrect.

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### **Impact on Businesses and Public**

Rule 421 applies to anyone that burns wood, pellets or any other solid fuel in open fires or solid fuel burning devices (fireplaces, wood or pellet stoves or inserts), and commercial fireplace installations in locations such as hotels and restaurants.

Hotels and restaurants with wood burning devices would have a cost savings from mandatory curtailments, because they burn wood for aesthetic purposes. Staff does not have information to quantify the impact, if any, to these businesses due to the loss of ambiance. There will be a cost impact to wood retailers, because mandatory curtailment will reduce the amount of wood burned by the public, and therefore, the amount of wood sold by retailers. The estimated cost of the wood products not burned on a mandatory curtailment day is \$55,920 – \$216,460, or \$1,677,460 – \$6,493,800 over the entire winter season.

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<sup>5</sup> Imposed under authority of California Health and Safety Code Section 42402.5.

The majority of the people affected by the rule burn wood for ambience and would have cost savings from reduced wood use. For people who use wood as their primary or supplemental heat source, there will be a shift in costs from wood to an alternate source of heat. Anecdotal information from comments during public workshops suggests that some consumers may have reduced heating costs from using wood or pellets as a supplemental heat source. However, in most situations, it costs less to heat a home with natural gas or electricity than with wood<sup>6</sup>. The fuel costs for a specific amount of heat produced are shown in the following table.

	Thermal Efficiency	Fuel Cost per MMbtu
Fireplace	7%	\$267.76
Certified Wood Stove	63%	\$29.75
Pellet Stove	76%	\$20.56
Propane Fireplace	75%	\$27.67
Natural Gas Fireplace	75%	\$15.07
Electric Fireplace	>99%	\$23.39
Gas Central Heat & Air	80%	\$14.13
Electric Central Heat & Air	>99%	\$23.39
Propane Central Heat & Air	80%	\$25.94

The fuel cost comparison clearly shows that for a given unit of heat delivered to a home; wood is the most expensive of the available fuels. The average cost of heating a home with a wood stove for 30 days is \$181, while the cost is \$142 for electricity and \$92 for natural gas. Reported cost savings may result from personal comfort choices and/or because supplemental sources heat main living areas while other rooms remain cooler than the home's alternative heat source would provide, resulting in a net reduction in heat delivered. Staff cannot rely on this anecdotal information to estimate community scale impacts.

In houses where a wood burning device is the sole source of heat, wood burning will be allowed. Also, if Version B of the rule is adopted, for households where a mandatory curtailment would create an economic hardship and the granting of a exemption would not cause an adverse impact, the Air Pollution Control Officer would be authorized to grant a hardship exemption.

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### District Impacts

The costs to the District for implementing Rule 421 fall into three general areas: 1) forecasting PM2.5 air quality, 2) public outreach to educate and inform the public, and 3) enforcement/compliance.

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<sup>6</sup> In the case that free wood is delivered to the residence at no cost, there would be an increase in fuel cost.

If Rule 421 is adopted, additional contract effort will be required to refine the forecasting tools to focus on forecasting Sacramento County violations of the federal 24-hour health standard, rather than the region's air quality in general. Staff estimates the cost of this additional forecasting effort to be \$28,000 for the first year with approximately \$8,000 being required for each subsequent year.

Public outreach information about Check Before You Burn will appear on District Web sites and through the existing Air Alert notification program, which has been enhanced to target Sacramento County subscribers only. Due to the mandatory nature of Rule 421, a more comprehensive outreach program will be undertaken, which may include direct mail, print advertisements and press releases in local and ethnic community newspapers, radio commercials, print materials in multiple languages distributed by volunteer community groups and businesses, and District compliance inspection staff. The total cost for these outreach efforts is estimated to be approximately \$160,000 per year.

Compliance with the rule will be determined by visual inspection to determine if solid fuel burning is occurring. Indoor use of burning devices will be detected by observing smoke from chimneys or flues. The estimated staff resources for enforcement/compliance are 0.4 FTE.

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## **Emission Inventory and Reductions**

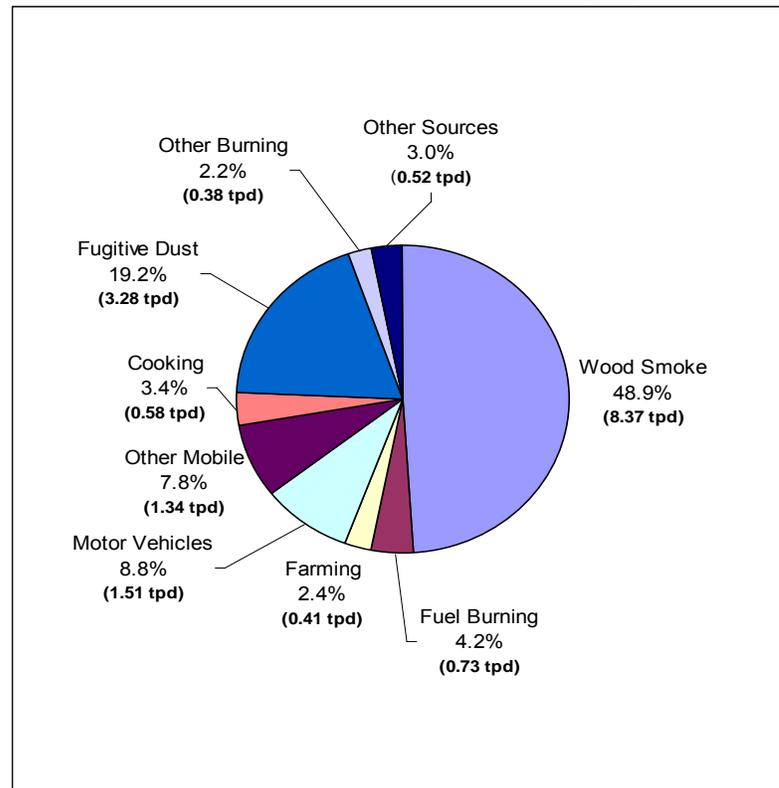
Wood smoke is the single largest emissions source, 49%, as reported by the California Air Resources Board's 2006 wintertime PM<sub>2.5</sub> emissions inventory for Sacramento County.

The California Air Resources Board is responsible for preparing the wood burning emission inventory for Sacramento County. The current CARB inventory (2006) estimates PM<sub>2.5</sub> emissions to be 8.37 tons on an average winter day from wood burning in Sacramento County. CARB estimates are based on a 1987 survey conducted in Healdsburg, California that suggested that 0.28 cords of wood is burned per household per year<sup>7</sup>.

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<sup>7</sup> California Air Resources Board, Area Source Methodology, Section 7.1, Residential Wood Combustion, Revised July 1997

### 2006 Wintertime PM2.5 Inventory by Source<sup>8</sup>



Using Sacramento specific data, Staff estimates that PM2.5 emissions from wood burning in Sacramento County are 2,732 - 4,280 tons per year and 22.8 - 35.6 tons on an average<sup>9</sup> winter day. This estimate is based on the UCB/CARB 2003 survey data for Sacramento (Houck) that indicated the usage of wood at 0.92 cords per year. The range of emissions is based on the number and percent of homes that burn from the 2003 survey (Houck) and the 2007 telephone survey (Aurora). If this range of emission estimate was used then the contribution of wood smoke to the overall PM2.5 inventory would be 72% - 80%.

The emissions reductions have been calculated based on both the CARB emission inventory from above and based on the higher emission inventory using the usage patterns from the UCB/CARB 2003 survey data or the 2007 telephone survey. The calculations in both cases assume a compliance rate of 78% based on the telephone survey. Actual air quality benefits from this program depend on several factors including the accuracy of the PM2.5 forecasts and effectiveness of the public outreach efforts to educate wood burning residents, the actual compliance rates, and weather.

<sup>8</sup> California Air Resources Board, Emission Inventory, Emission Data, Criteria Emissions, Forecasted Emissions by Summary Category 2007 Almanac (Base Year 2006), Winter, PM2.5, 2006, Sacramento Metropolitan AQMD, [www.arb.ca.gov/app/emsmv/fcemssumcat2007.php](http://www.arb.ca.gov/app/emsmv/fcemssumcat2007.php)

<sup>9</sup> Based on a 120-day winter

The table below summarizes the inventory and potential emission reductions for each curtailment day from both the CARB emission inventory and the inventory extracted from the survey data.

Emission Inventory and Emission Reductions

Pollutant	CARB Inventory Tons/day		SMAQMD Estimates Tons/day	
	Inventory	Reductions	Inventory	Reductions
PM10	8.69	6.78	23.67 – 36.96	18.43 – 28.86
PM2.5	8.37	6.53	22.8 – 35.6	17.75 – 27.8
NOx	0.71	0.49	3.8 – 4.1	2.5 – 2.9
CO	65.9	51.30	275 - 317	214 – 247

Reducing the wood smoke reduces emissions of toxic air contaminants including carcinogens. It also improves indoor air quality in your home.

### Cost Effectiveness

The overall cost effectiveness of proposed Rule 421 is estimated to be \$3.99 – \$4.72 per pound of PM2.5 reduced and \$3.66 – \$4.39 per pound of NOx + PM2.5 reduced. To put this cost effectiveness into perspective, Rule 417, Wood Burning Appliances, adopted October 2006, had a cost effectiveness of \$4.19 per pound of PM2.5 reduced. Rule 411, affecting commercial and industrial boilers and water heaters, adopted October 2005, had a cost effectiveness of \$13.90 per pound of NOx reduced.

### Environmental Review and Compliance

Rule 421 was created as part of the response to the requirements of Senate Bill 656 that the District implement cost-effective control measures for particulate matter emissions. Staff finds that the proposed rule is exempt from the California Environmental Quality Act as an action by a regulatory agency for protection of the environment (Class 8 Categorical Exemption, Section 15308 State CEQA Guidelines) and because it can be seen with certainty that there is no possibility that the activity in question may have a significant adverse effect on the environment (Section 15061(b)(3), State CEQA Guidelines).

California Public Resources Code (Section 21159) requires an environmental analysis of the reasonably foreseeable methods of compliance. The proposed rule will not increase emissions and will not cause any significant adverse effects on the environment; therefore the Environmental Coordinator has concluded that no environmental impacts will be caused by compliance with the proposed rule.

## Public Outreach

Staff conducted eight public workshops throughout Sacramento County between July 23 and August 1. One of them included a structured presentation, on July 26, 2007, at the District Offices. The other seven were held in an open house format to encourage conversational dialogue with affected residents and businesses. The noticing for these public meetings included:

- Letters to all elected officials in Sacramento County
- Ad in the Metro Section of the Sacramento Bee
- Notice to 15 newspapers for inclusion in the calendar sections
- Notice to 18 radio stations and 10 television stations
- Letters to 50 homeowners associations and 51 neighborhood associations
- Notice on the District's web site
- Notices by mail to those requesting it
- Notices also sent to senior centers, adult education centers, and community centers

Staff conducted stakeholder meetings on August 6<sup>th</sup> and 8<sup>th</sup>. Attendees included representatives from HRD/Hoyt, Buffalo Chips, Asian Pacific Chamber of Commerce, Natomas Chamber of Commerce, and the Cleaner Air Partnership.

Staff presented Rule 421 requirements for discussion at city council meetings in late August and early September and at the La Raza Network meeting on September 6, 2007.

A notice for the September 27, 2007 public hearing was published in the Sacramento Bee, Metro Section on August 28, 2007. The notice was also mailed to attendees of the public workshop, affected sources, and persons who have requested rulemaking notices.

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## July Board Discussion

On July 26, 2007, staff presented an informational item to the Board. Board members requested additional information.

Q) Which months are most likely to have no-burn days? Are there wood burning patterns such as weekday versus weekend and holidays?

A) Over the past three years, December had the highest number of days above the federal health standards, followed by January, November, and February. Roughly 56% of the days over the threshold were weekdays, while 44% were on weekend days. There was no discernable pattern concerning holidays.

Q) What are surrounding counties doing about wood burning?

A) Bay Area AQMD is currently in the process of developing a residential wood burning rule, which includes mandatory curtailment. San Joaquin has a combination voluntary and mandatory no burn rule. El Dorado County and Placer County have a commitment to evaluate voluntary no burn programs for their areas. Yolo Solano and Feather River

do not have any commitments to look at either a voluntary or mandatory no burn program.

Q) What are other areas requiring with respect to certified devices?

A) Mammoth Lakes and Denver established rules 12-20 years ago to address federal PM10 nonattainment problems. Albuquerque also established rules at this same time but were not nonattainment for PM10. All three areas allow certified devices to burn on no mandatory burn days. Their rules were put in place about the time EPA issued certification requirements. None of these areas is expected to violate federal PM2.5 violations. San Joaquin established their program to address federal PM10 nonattainment problems. Their rule includes a voluntary program that discourages burning in non-certified devices at one air quality level, but the mandatory ban applies to all devices, including certified devices, at a poorer air quality level. Puget Sound prohibits the use of non-certified devices at one air quality level and asks that people with certified devices to voluntarily not burn. They ban the use of all devices, including certified devices, at a poorer air quality level, similar to San Joaquin.

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## Public Comments

Staff has received many comments including:

Comment - Certified devices should be exempt from mandatory curtailments.

Response - Special requirements for certified devices are not recommended for several reasons:

1. While certified devices and pellet stoves are designed to pollute less than fireplaces and non-certified wood stoves, their emissions are about an order of magnitude higher than gaseous fueled devices.

Comparison of Emission Factors

Technology	PM2.5 Emission Factor (lb/mmBtu)
Certified Wood Stove	1.85
Pellet Stove	0.69
Propane Fireplace	0.01
Natural Gas Fireplace	0.01
Electric	None

2. Certified devices and pellet stoves can smoke if not installed or operated properly. Prohibiting all wood smoke, whether from a certified device or uncontrolled fireplace is most appropriate for air quality and equity reasons.
3. Collectively, certified wood and pellet stoves and inserts comprise 7% of the wood burning emissions. This percentage will increase as new devices are installed or older devices replaced, particularly since no new fireplaces may be installed after October 2007, and new developments must use either gas fireplaces or certified equipment. All emissions reductions contribute to attainment of federal health standards.
4. Although pellet stoves are easily recognizable to the public, certified wood stoves are

not easily distinguished from non-certified wood stoves. To know you have a certified stove you either need to know when the device was purchased (after 1992), or check the model number of the stove (located on the back or side of the device) and look it up on EPA's website. This may be difficult for some residents and would make enforcement more difficult.

5. Independent public opinion surveys reported that only 13% of residents' rate wood smoke as a very serious cause of winter time air pollution. Public education staff and our consultants stress the importance of creating a simple message as a key to the success of Rule 421 outreach efforts. Creating additional complexity will further burden an already difficult educational effort.
6. Although manufacturers suggest that creating special provisions for certified devices will increase compliance, no data has been provided or is available that substantiates these assertions. Compliance rates are difficult to predict and depend on a number of factors.
7. Manufacturers also suggest that not allowing certified devices to operate on some or all no burn days creates a disincentive to replace dirty devices with cleaner burning alternatives. No data has been provided to substantiate that assertion. Replacing dirty devices with cleaner burning alternatives is fairly expensive. The capital and operating costs are likely to be more significant factors in determining whether to replace dirty devices, and the choice of which devices to select. The District's incentive program provides the greatest incentive to install gaseous fueled devices. Voucher data suggests that 60% of incentive program participants choose gaseous fueled devices. Staff can track this and propose modifications to incentives or rule requirements if participation levels drop.

	Cost of Devices <sup>10</sup>	Thermal Efficiency	Fuel Cost \$ per MMBtu	Voucher incentive	
				Non-EJ	EJ
Wood Stove	\$600-2900	63%	29.75	\$250	\$400
Wood Insert	\$1100-3000	63%	29.75	250	400
Gas/Propane Stove	\$1000-2700	75%	27.67	350	500
Gas Insert	\$1400-3500	75%	15.07	350	500
Pellet Stove	\$1200-4100	76%	20.56	350	500
Pellet Insert	\$1400-3800	76%	20.56	350	500
Electric fireplace	~\$300	>99%	23.39	0	0

8. Finally, if the Board of Directors were interested in creating a voluntary no burn program that allows certified devices to operate, but not uncertified, the Board could direct staff to implement this option at any time. Such a program does not require regulatory language to implement.

Comment - The contribution of wood burning to the PM2.5 emission inventory has been overstated.

Response – The California Air Resources Board (CARB) inventory, when expressed on a per capita basis is consistent with other areas with similar population and climate (see

<sup>10</sup> Installation costs are pretty similar \$350-500 and additional material costs had a wide range from \$250-1000 depending on the specifics of the installation. Installation and material costs for electric fireplaces are 0-\$75.

Staff Report, page 36 of this Board Package), and lower than more rural counties nearby. When expressed as a percentage of a total inventory, Sacramento's inventory appears larger than areas with other dominant industrial or agricultural sources. Because of the larger percentage it is particularly important to Sacramento's air quality to reduce these emissions. Air monitoring data corroborates the CARB inventory. Sacramento specific survey information suggests the inventory may be understated.

Comment - Mandatory curtailments could result in economic hardship for people who use wood for supplemental heating and have limited incomes.

Response – Staff proposed an alternative for the Air Pollution Control Officer to grant hardship exemptions unless that exemption would have adverse impacts. The hardship exemptions must be requested annually, and supported with economic information. The location of the residence will be considered when deciding whether there will be adverse impacts from granting the exemption.

Comment - Switching heating fuels from wood to natural gas or electricity will increase the emissions of greenhouse gases.

Response – The rule will reduce greenhouse gases associated with fires that are burned for ambiance. Wood burned for supplemental heating needs may be replaced by gas or electric heat sources. However, burning wood for heat emits approximately two to five times more greenhouse gases than the replacement fuels. Experts suggest that if the wood is from a sustainable source that the wood burning emissions may be considered "carbon neutral." "Sustainable source" means that the harvested tree is replaced with a newly planted tree. Staff contacted five local wood vendors and determined that most wood fuel in the Sacramento area came from non-sustainable sources. Sustainable source wood burning may be carbon neutral over a long life cycle, which for greenhouse gases can be hundreds of years. Burning the wood emits high levels of greenhouse gases in a few hours, but if wood instead decomposes naturally it emits greenhouse gases over 2-145 years.

CARB conducted a public meeting on September 6, 2007 to solicit input on a protocol on how to assess greenhouse gas impacts from forestry products. No approved CARB protocol is available at this time. AB32, California Global Warming Solutions Act of 2006, requires CARB to: 1) consider the time period for the emissions and 2) to ensure that greenhouse gas regulations do not interfere with efforts to achieve health based air quality standards. AB32 health-based requirements are consistent with Rule 421 objectives since reduction in wood burning contributes significantly to PM2.5 air quality problems.

Comment - There isn't a real possibility of avoiding a federal nonattainment designation for PM2.5.

Response – See the earlier discussion of this issue in the State and Federal Requirements, page 3.

Additional changes that were made to the proposed rule and staff report in response to comments included 1) adding an exemption for wood fires integral to religious ceremonies and 2) clarifying that wood burning fires, including backyard firepits and bonfires, are subject to this rule.

A complete discussion of comments and staff responses, are presented in Appendix E of the staff report (page 126 of this Board Package).

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## **Conclusion**

Proposed Rule 421 will reduce emissions from the single largest PM2.5 emissions source, largely unregulated in the past, reduce the serious health effects of wintertime particulate pollution, potentially avoid some consequences from federal nonattainment designation, and satisfy the requirements of state law (Health and Safety Code Section 39614). Staff recommends that the Board decide whether to include an economic hardship exemption in the rule, determine that Rule 421 is exempt from CEQA and approve the attached resolution adopting Rule 421 as proposed.

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Respectfully Submitted

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Larry Greene; Air Pollution Control Officer  
Sacramento Metropolitan  
Air Quality Management District

Approved as to form:

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Katherine Pittard, District Counsel  
Sacramento Metropolitan  
Air Quality Management District

Attachments

**Attachment A**

**Board Resolution**

**RESOLUTION NO. AQM \_\_\_\_\_**

**Rule 421 – MANDATORY EPISODIC CURTAILMENT OF WOOD AND OTHER SOLID FUEL BURNING**

**THE BOARD OF DIRECTORS  
OF THE SACRAMENTO METROPOLITAN AIR QUALITY  
MANAGEMENT DISTRICT**

**WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District is authorized to adopt, amend or repeal rules and regulations by Sections 40001, 40702, 40716, 41010, 41013, and 42402.5 of the California Health and Safety Code (Health and Safety Code Section 40727(b)(2)); and**

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District has determined that a need exists to adopt Rule 421 – MANDATORY EPISODIC CURTAILMENT OF WOOD AND OTHER SOLID FUEL BURNING to meet the requirements of Section 39614 of the California Health and Safety Code (Health and Safety Code Section 40727(b)(1)); and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District has determined recent air quality data shows that Sacramento County exceeds attaining the 24 hour PM2.5 national ambient air quality standards set by EPA in 2006 and that a need exists to adopt Rule 421 – MANDATORY EPISODIC CURTAILMENT OF WOOD AND OTHER SOLID FUEL BURNING to make progress towards attaining that standard; and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District has determined that the meaning of Rule 421 can be easily understood by the persons affected by it (Health and Safety Code Section 40727(b)(3)); and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District has determined that Rule 421 is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations (Health and Safety Code Section 40727(b)(4)); and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District has determined that Rule 421 does not impose the same requirements as any existing state or federal rule or regulation that applies to affected sources within the District (Health and Safety Code Section 40727(b)(5)); and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District has determined that Rule 421 implements Health and Safety Code Section 39614 (SB 656 Particulate Matter) (Health and Safety Code Section 40727(b)(6)); and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District has considered a written analysis prepared by staff (Health and Safety Code Section 40727.2); and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality

Management District has maintained records of the rulemaking proceedings (Health and Safety Code Section 40728); and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District held a duly noticed public hearing on September 27, 2007 and considered public comment on the proposed Rule 421 (Health and Safety Code Sections 40725 and 40726); and

WHEREAS, the Board of Directors of the Sacramento Metropolitan Air Quality Management District has considered the socioeconomic impacts of the rule (Health and Safety Code Section 40728.5); and

WHEREAS, the California Environmental Quality Act (CEQA) under Section 15308 of the State CEQA Guidelines, exempts actions by a regulatory agency for the protection of the environment; and Section 15061(b)(3) of the State CEQA Guidelines exempts actions that can be seen with certainty that there is no possibility that may have a significant adverse effect on the environment.

NOW, THEREFORE, BE IT RESOLVED THAT the adoption of Rule 421 is exempt from the California Environmental Quality Act (CEQA); and

BE IT FUTHER RESOLVED THAT the Board of Directors of the Sacramento Metropolitan Air Quality Management District has considered the need for an economic hardship exemption and approves and adopts Version \_\_\_\_\_ of proposed Rule 421 – MANDATORY EPISODIC CURTAILMENT OF WOOD AND OTHER SOLID FUEL BURNING; and

BE IT ORDERED that Rule 421 be effective as of September 27, 2007.

ON A MOTION by Director \_\_\_\_\_, seconded by Director \_\_\_\_\_, the foregoing Resolution was passed and adopted by the Board of Directors of the Sacramento Metropolitan Air Quality Management District, State of California, this 27<sup>th</sup> day of September, 2007, by the following vote, to wit:

AYES: Directors

NOES: Directors

ABSENT: Directors

\_\_\_\_\_  
Chairperson of the Board  
Sacramento Metropolitan Air Quality Management District  
State of California

(SEAL)

ATTEST: \_\_\_\_\_  
Clerk of the Board  
Sacramento Metropolitan Air Quality Management District

**Attachment B**

**Draft Rule 421**

**Attachment C**

**Staff Report**

**Attachment D**  
**Written Comments**

**Attachment E**  
**Evidence of Public Notice**