

**SACRAMENTO METROPOLITAN
AIR QUALITY MANAGEMENT DISTRICT**

STAFF REPORT

Rule 417, Wood Burning Appliances

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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 District is currently designated as a nonattainment area for the state and federal¹ PM10 standards and for the state PM2.5 standard. The 2004 emission inventory for Sacramento County shows that wood smoke accounts for 20% of wintertime PM10 emissions and 44% of wintertime PM2.5 emissions. Senate Bill 656 (SB 656, Sher, Health and Safety Code Section 39614) required the California Air Resources Board (CARB) to develop a list of the most readily available, feasible, and cost-effective control measures that could be employed to reduce PM emissions, and each air district to adopt an implementation schedule for the most cost-effective measures.

In November of 2004, CARB adopted a list of PM control measures to be considered by districts, and on July 28, 2005, the District adopted an implementation schedule for SB656. The following measures for wood burning were contained in the SB656 implementation schedule:

- Require use of USEPA-Certified Phase II or equivalent devices
- Public Awareness Program with either a voluntary curtailment or mandatory curtailment
- Require replacement of non-certified units upon sale of property

1 Based on 1998-2000 monitoring data, EPA made a finding (February 15, 2002 Federal Register, Volume 67, Number 32 Page 7082 et.seq) that Sacramento County attained the federal ambient PM10 standard by the applicable December 31, 2000 attainment deadline. Note that this EPA finding did not redesignate the Sacramento district to attainment.

- Restrict number of wood burning fireplaces allowed in new residential developments
- Control of wood moisture content. Prohibit burning materials that are not intended for use in fireplace/heater

The District committed to complete further study of each of these measures in 2006, and if found to be feasible, adopt the measures by the end of 2007. Rule 417 is being proposed to implement several of these wood burning measures, while the remainder will be studied further for possible adoption in 2007. Specifically, Rule 417 will implement the following control measure elements:

1. Prohibit the installation of any new, permanently installed, indoor or outdoor, uncontrolled fireplaces in new or existing developments,
2. Prohibit the sale, installation, or transfer of any wood burning appliance that is not U.S. EPA Phase II certified, or equivalent,
3. Require proper operation of U.S. EPA Phase II certified wood burning appliances,
4. Require distribution of educational information about wood burning at point of sale of new wood burning appliances,
5. Require wood advertised as "seasoned" or "dry" to contain 20% moisture or less, and
6. Prohibit burning of garbage and other items not intended for use as a fuel.

Restrictions on wood burning appliances have been adopted by several California air districts and other local jurisdictions, including:

- San Joaquin Valley Unified APCD;
- Yolo-Solano AQMD;
- Great Basin Unified APCD;
- Placer County APCD;
- Shasta County AQMD;
- Feather River AQMD;
- San Luis Obispo County APCD;
- Glenn County APCD;
- Butte County AQMD;
- Kern County APCD; and
- City of Sebastopol.

Appendix C contains a detailed list of the specific measures adopted by these districts and local governments.

Traditional uncontrolled fireplaces are usually one of two types: site installed masonry fireplaces and factory built fireplaces. These units are used primarily for aesthetic purposes or to provide space heating. The main source of emissions from these units is from incomplete combustion.

For this rule, control measures for wood burning fall into two categories: improving combustion efficiency and replacing fuels. Improved combustion controls include EPA certified wood stoves and proper burning techniques. Replacement fuels include natural gas and electricity.

Proper burning techniques focus on proper fuel selection and fire building. Wood with moisture content of 20 percent or less, known as “dry” or “seasoned”, burn hotter and faster, since less heat is required to remove the water from the wood. This leads to more complete combustion. Properly shaping the fire also improves the combustion efficiency. Providing information on proper burning to the public will lead to improved adoption rate of proper burning technique. Additionally, setting a moisture standard for wood advertised as “dry” or “seasoned” will ensure that consumers seeking to reduce their impact on emissions of wood smoke will not be thwarted in their efforts.

Wood stoves are wood burning appliances that are enclosed to control combustion air. EPA certified stoves employ either non-catalytic or catalytic systems, to provide for more complete combustion of the exhaust stream. These units are either stand alone or installed into walls, either as a new unit or into existing fireplaces. Pellet stoves burn pellets made from wood products, and utilize fuel and active air management systems to control the combustion efficiency. Masonry heaters are large units designed to burn a fire quickly, absorb the heat within the structure, and release the heat slowly. In addition to increasing combustion efficiency, many stoves have fan systems to circulate heated air into the home, increasing the thermal efficiency.

The most widely used alternate fuel is natural gas. Simple systems employ natural gas piped into a hearth with gas logs to produce the look of a wood burning fire. Natural gas inserts are installed into walls or existing fireplaces and can be equipped with fan systems to circulate heated air into the home.

Another alternative to wood burning is an electric fireplace. Electric fireplaces use lights or other means to simulate fire, and can include electric space heating elements, fan systems to circulate heated air into the home, and air filtration.

LEGAL MANDATES

Federal Mandate: The District has attained the current federal PM2.5 standard, and has attained the federal ambient PM10 standard (though the EPA has not yet redesignated it). The District is expected to be designated nonattainment for the new federal PM2.5 standard. The new federal PM2.5 standards are due in September 2006, with nonattainment designation expected in November 2009 and attainment plans due by 2013. Emission reductions from residential wood combustion are expected to be necessary to attain the federal PM2.5 standard.

State Mandates:

The District is currently designated as a nonattainment area for the state PM10 and PM2.5 standards. SB656 required ARB to adopt a list of the most feasible and cost effective control measures to make progress towards state and federal PM10 and PM2.5 standards. Districts were then required to adopt an implementation schedule for measures by July 31, 2005. On July 28, 2005, the District adopted the following schedule for control measures for wood burning fireplaces and wood burning heaters.

PM Control Measures and Schedule

Control Measure	Further Study Completed	If Cost-effective Emission Benefit Determined	
		Consideration by the Board	If adopted, Full Implementation Date
Require use of USEPA-Certified Phase II or equivalent devices	2006	2007	2008
Public Awareness Program with either a voluntary curtailment or mandatory curtailment	2006	2007, if mandatory curtailment needed	2007
Require replacement of non-certified units upon sale of property	2006	2007	2008
Restrict number of wood burning fireplaces allowed in new residential developments	2006	2007	2008
Control of wood moisture content. Prohibit burning materials that are not intended for use in fireplace/heater.	2006	2007	2008

Proposed Rule 417 implements several of these control measures in advance of the SB656 schedule. Other control measures to be studied further include mandatory curtailment, replacement of noncertified units upon sale of property, and density restrictions for new wood burning appliances.

SUMMARY OF REQUIREMENTS

Rule 417 applies to any person who manufactures, sells, offers for sale, installs, or operates a wood burning appliance, and to any person who sells, offers for sale, or supplies wood intended for burning in a wood burning appliance. Rule 417 will:

1. Prohibit the installation of any new, permanently installed, indoor or outdoor, uncontrolled fireplaces in new or existing developments,
2. Prohibit the sale, installation, or transfer of any wood burning appliance that is not U.S. EPA Phase II certified, or equivalent,
3. Require proper operation of U.S. EPA Phase II certified wood burning appliances,
4. Require distribution of educational information about wood burning at point of sale of new wood burning appliances,
5. Require wood advertised as "seasoned" or "dry" to contain 20% moisture or less, and
6. Prohibit burning of garbage and other items not intended for use as a fuel.

The rule allows for the installation of pellet stoves and masonry heaters as an alternative to traditional fireplaces. Due to the requirements set forth in Title 40 Code of Federal Regulations, Part 60, Subpart AAA, most appliances in these classes are unable to receive

certification². However, these devices have emission factors that are even lower than certified wood stoves. Therefore, they are included as allowable alternatives to traditional fireplaces.

Except for the prohibition against burning garbage, existing fireplaces and non-certified wood stoves are not affected by this rule. Existing appliances installed in homes for sale are not affected by this rule. Chimineas and outdoor firepits, which are designed for portable, outdoor use, are not covered by the rule. These items will be evaluated in the Further Study Measure.

EMISSIONS IMPACT

Targeted EIC Categories and Inventory 2004

The CARB emissions inventory for wood burning in Sacramento County is summarized in the following table. Annual PM10 emissions are 1,718 tons per year, and PM2.5 emissions are 1,654 tons per year.

Annual Average Emissions

CES/EIC Codes	Material Description	VOC Emissions tpd	NOx Emissions tpd	PM10 Emissions tpd	PM2.5 Emissions tpd
610-600-0230-0000	Wood Comb - Wood Stoves	0.357	0.069	0.764	0.736
610-602-0230-0000	Wood Comb - Fireplaces	1.657	0.317	3.943	3.796
	Total	2.014	0.386	4.707	4.532

The largest impact of proposed Rule 417 will be to limit the amount of PM emissions from new development. Based on projected housing construction rates³ and typical existing installation and usage rates for Sacramento County, emissions of PM10 would increase by 84.2 tons in 2006 and by a similar amount each subsequent year. PM2.5 emissions, based on the ratio of PM2.5 to PM10 used in the CARB estimate would be 81.0 tons per year.

The emissions reductions are based on the assumption that new developments being built will mirror existing installation and usage patterns. Emissions are based on the following assumptions:

- 39% of residences have fireplaces
- 71% of residences with fireplaces burn wood
- 35% of residences with fireplaces burn manufactured logs
- 56% of fireplace use is for aesthetic (not heating) purposes
- The average wood usage per residence that burn wood is 0.92 cords per year
- The average manufactured log usage per residence that burn wood is 19 logs per

2 Title 40 Code of Federal Regulations, Part 60, Subpart AAA definition of wood heater includes the following criteria: an air-to-fuel ratio less than 35-to-1, and a maximum weight of 1,760 lb. Pellet stoves typically have an air-to-fuel ratio greater than 35-to-1. Masonry stoves typically weight more than 1,760 pounds.

3 20,000 new units to be constructed in 2006 (Nevin, 2006).

year

- 33% of residences have wood stoves or fireplace inserts. No reductions are calculated from these units, since this rule will not affect how any new installations of these units would occur (current Federal rules only allow certified units).

Based on these usage numbers and emission factors, the total emissions of PM10 from all of the residences built in a year will be 84.2 tons. The amount of reduction will vary based on the method of compliance with the rule chosen. Detailed calculations and data sources are presented in Appendix D.

The main requirement of this rule is the prohibition of the installation of traditional open hearth fireplaces. The most effective option for compliance with this requirement would be for affected residential and commercial units to have no other fuel burning appliance installed. This would lead to a 100% reduction in emissions from future fireplaces. However, it is not expected that a significant number of affected parties will choose this option.

A nearly as effective option as no fuel burning appliance is to install electric fireplaces instead of wood burning fireplaces. These are a combination of electric space heaters and simulated flames. The heating elements can often be operated independent of the flames. Since the heating element for these systems is an electric resistor, no emissions are produced at the source; therefore there is a 100% reduction in emissions.

Another option is to install natural gas-fired appliances instead of wood burning fireplaces. Within this choice, there are several options, ranging from plumbing a hearth for natural gas with ceramic gas logs, to large fireplace inserts with sealed (combustion air intake from outdoors) chambers, electronic ignition and controls, and blowers for hot air exchange for space heating. Due to the low PM10 emissions from burning natural gas, this option will lead to a 99.9% reduction in emissions.

The final option is to install either an EPA Phase II certified wood stove/insert, masonry heater, or pellet-fueled wood burning stove. These appliances control emissions through a combination of techniques, including controlling air flow, regulating burning rate, promoting more complete combustion, and improving thermal efficiency. These appliances both have lower emissions per pound of wood and reduce the amount of wood consumed. This option will lead to an 85.4% reduction in emissions.

- In order to determine the overall reduction, the District has assumed an expected ratio of compliance options, based on current installation patterns. The key assumption is that 39% of new residences to be built that would have installed a traditional wood burning fireplace (7800 units) will install some other type of appliance. Additionally, the following assumptions are used:
 - 23%⁴ of total new homes will be natural gas (4600 units)

⁴ 60% of new hearth appliance installations are natural gas (Crouch). 60% natural gas x 39% homes with appliance = 23% of total new homes with natural gas. 1% is the minimum amount used for this calculation. The remaining balance of new units will be a certified appliance.

- 1% of the total new homes will install electric appliances (200 units)
- 15% of total new homes will install certified appliances (3000 units)

The control measures in the Rule are expected to reduce PM10 emissions 79.5 tons in the first year of implementation. The emissions reduction should continue to increase by the same amount each subsequent year.

Rule 417 will also reduce NOx emissions. The main mechanism for this control is the reduction in wood use, since the increased efficiency of certified devices requires 89% less wood to be combusted for an equal amount of useful heat, compared to traditional fireplaces. This leads to a reduction in NOx emissions of 5.5 tons per year.

COST IMPACT

Section 40703 of the California Health and Safety code requires that the District consider and make public its finding relating to the cost effectiveness of implementing an emission control measure.

Cost to Businesses: The proposed rule will require builders to either not build fireplaces or install appliances compatible with the rule. While not installing any fireplace or wood burning appliance would save the builder cost, consumer demand in some cases is expected to require installation of some other option. Therefore, the cost to the builders will be the increased cost of purchasing and installing certified stoves or other units.

The following table shows the range of additional cost of installing a compliant wood burning appliance or other device in place of a traditional wood burning fireplace. This cost is expected to be passed on to home buyers.

Device	Incremental Capital/Installation Cost (per unit)	Total Cost* (\$/yr)
Electric Fireplace	\$400	\$3,120,000
Natural Gas Insert	\$500	\$3,900,000
EPA Certified Phase II Wood Stove Non-Catalytic	\$2500	\$19,500,000

* Total cost of compliance for each type of device if all fireplaces that would have been constructed or installed use each option (7800 units). For example: 7800 electric fireplaces cost \$3.1 million.

Cost to Public: As discussed above, the cost of the additional equipment required by the builders is likely to be passed on to home buyers. However, the additional cost is less than 0.7% of the median price of a home⁵ in Sacramento county, and is not expected to have a large impact on the affordability of new houses or the housing market in general. Additionally, the use of required appliances will result in reduced fuel costs. The average fuel cost per home for a traditional fireplace is \$92.14 per year. The potential cost savings are presented in the following table.

5 \$375,000 as of December 2005, (Sacramento Association of Realtors)

Device	Fuel Use Cost Savings ⁶ (\$/unit•yr)	Fuel Use Cost Savings (\$/yr)
Electric Fireplace	\$86.37	\$17,273
Natural Gas Insert	\$43.73	\$201,154
EPA Certified Phase II Wood Stove, Non-Catalytic	\$66.95	\$200,852

Overall Rule Cost Effectiveness: The cost effectiveness of the rule is dependent on the compliance methods chosen. To calculate the overall cost effectiveness for the proposed rule, the District has assumed a mixture of compliance methods. The detailed calculations are presented in Appendix D. The overall cost effectiveness is estimated to be \$4.19 per pound of PM10. To put these costs into perspective, it is useful to compare with the cost effectiveness for other District rules. It should be noted that most of the District's existing rules are for controlling ozone precursors, usually VOC or NOx. Therefore, there are no rules to compare PM10 cost effectiveness against directly. When compared to the cost effectiveness for VOC and NOx rules, though, Rule 417 is near the lower end of the range of costs imposed by other District rules. For example, the cost effectiveness of the gasoline dispensing regulations (Rule 449, Transfer of Gasoline into Vehicle Fuel Tanks; 12/17/1991 rule amendments), is at the high end of the cost effectiveness range, costing \$17/lb of VOC in today's dollars. Rule 452, Can Coating (8/21/1990 rule amendments), is at the low end of the range at a cost of \$1/lb of VOC in today's dollars. Therefore, the cost effectiveness of Rule 417 is near the lower end of the range of costs imposed by other District rules.

Cost to the District: The cost to the District consists of the additional staff time needed to evaluate building permits, perform inspections to ensure compliance with the rule, and the cost of providing educational information to wood burning appliance retailers. Staff estimates the proposed amendments will result in the need for an additional 0.41 FTE (full time equivalent), and \$2,200 per year for the production of educational information.

SOCIOECONOMIC IMPACT

CHSC Section 40728.5 requires a district to perform an assessment of the socioeconomic impacts before adopting, amending, or repealing a rule that will significantly affect air quality or emission limitations. The District Board is required to actively consider the socioeconomic impacts of the proposal and make a good faith effort to minimize adverse socioeconomic impacts.

CHSC Section 40728.5 requires discussion of:

1. The type of industry or business, including small business, affected by the proposed

⁶ Electric fireplaces, when used for aesthetic purposes only, are essentially lighting appliances. No operational costs are associated with their use for this purpose. There are costs for using electric fireplaces for heat. Usage of natural gas for aesthetic use is not expected to require the use of the full capacity of natural gas stoves due to the firing range of these units. The District assumes the natural gas stoves would be utilized to 66% of their capacity for aesthetic use.

- rule or rule amendments.
2. The impact of the proposed rule or rule amendments on employment and the economy of the region.
 3. The range of probable costs, including costs to industry or business, including small business.
 4. The availability and cost-effectiveness of alternatives to the proposed rule or rule amendments.
 5. The emission reduction potential of the rule or regulation.
 6. The necessity of adopting, amending, or repealing the rule or regulation to attain state and federal ambient air standards.

Type of industry or business, including small business, affected by the rule: Rule 417 applies to the installation and use of wood burning appliances. This rule will affect large and small businesses, as well as the general public. Large businesses affected include the building industry and manufacturers of wood burning appliances. Examples of small businesses affected are retailers, chimney sweeps, wood suppliers, restaurants, and hotels. Anyone in the general public who burns wood will also be affected by this rule.

Impact of Rule 417 on employment and the economy in the District: This rule is expected to have minimal impact on employment and the economy. The industry most affected by this rule is the building industry. While the requirement to install alternatives to traditional fireplaces will require some adjustment on their part, the rule is not expected to cause any slowdown in construction. While some jobs within the industry may be reduced, (e.g., masons), the reduction should be offset by an increase in others (e.g., stove installers). Since this rule is targeted at new installations, it is not expected to have any impact on existing wood usage and sales by wood suppliers. Future growth in wood sales for use in fireplaces is expected to be reduced from 3.6% to 1.4% (with the 1.4% growth being used in wood stoves). Some of this reduction will be diverted to an increase in natural gas use.

The expected cost to the public is expected to be minimal. The initial cost will be built into the purchase price of a home, and ongoing use will provide a cost savings in fuel use.

Range of probable costs of Rule 417: The estimated costs per household for compliance with the rule are listed in the table below, based on the method of compliance. The initial cost will be offset by ongoing savings in fuel cost.

Compliance Method	Incremental Compliance Cost (\$/unit)
Electric Fireplace	\$400
Natural Gas Insert	\$500
EPA Certified Woodstove	\$2500

Availability and cost-effectiveness of alternatives to the Rule 417: One alternative to the proposed rule changes is not to adopt the proposed rule. However, the PM emission reductions from this rule will assist the District in meeting federal and state PM10 and PM2.5 air quality attainment goals. In addition, adoption of this rule implements several of the measures required by SB656.

Another alternative is to set a density restriction for the installation of fireplaces. This would allow for the installation of a limited number of uncontrolled fireplaces, which produce more emissions and burn more wood. This would lower the emission reduction benefits from the proposed rule.

Three additional control measures will be included in a Further Study measure: mandatory curtailment, replacement of noncertified units upon sale of property, and density restrictions for all wood burning appliances. These measures are not mutually exclusive, and each can provide emissions reductions in addition to those provided by proposed Rule 417. If found to be feasible, these measures will be considered for adoption in 2007.

The emission reduction potential of Rule 417: The proposed rule will achieve an emission reduction of 79.5 tons of PM10 per year in the first year of implementation, and the benefits will increase by this amount each year as additional housing units are built (See discussion under Emissions Impact).

The necessity of adopting, amending, or repealing the rule or regulation to attain state and federal ambient air standards: The proposed amendments to Rule 417 are necessary to comply with feasible and most effective control measures requirements of SB656 and to provide PM10 and PM2.5 emission reductions that contribute to attainment of the state and federal particulate matter standards.

INCREMENTAL COST EFFECTIVENESS ANALYSIS

Pursuant to Health and Safety Code Section 40920.6(a)(3), the District is required to perform incremental cost effectiveness analysis prior to adopting rules to meet the requirements for Best Available Retrofit Control Technology (BARCT). Rule 417 is not being adopted to meet a BARCT requirement; therefore an incremental cost-effectiveness analysis is not needed.

OTHER FACTORS:

Technological Feasibility: Staff evaluated the technological feasibility of the proposed rule. All technologies required are readily available and have been in use for some time. Some remodeling may be needed to install new units into existing structures, but this is a common service provided by retailers. Additional compliance options may become available in the future if fireplaces that can meet the EPA Phase II emissions limits are developed.

Enforceability: The compliance of installed devices can be determined by verifying the model of an installed unit. The EPA maintains a list of Phase II certified wood burning appliances. Additionally, any certified appliance is required to carry a certification plate. Natural gas units will carry certification to the applicable ANSI standard. The moisture content of seasoned or dry wood can be determined by ASTM Test Method D 4442-92.

Public Acceptability: A number of districts have adopted similar measures. Many of these

programs have been in effect since the early to mid-1990's. The San Joaquin and Yolo-Solano districts have rules which include most of the measures included in Rule 417.

SECTION 40727.2(a) ANALYSIS OF RULE 417

Section 40727.2(a) of the Health and Safety Code mandates that the District prepare a written analysis of the proposed Rule. Section 40727.2(a) also allows the District to put this analysis in a matrix form. The matrix analysis of Rule 417 is presented as Appendix A.

PUBLIC COMMENTS

Staff held a public workshop to discuss proposed Rule 417 on August 14, 2006. Staff received and addressed comments and questions at the workshop. Staff made the appropriate changes to the rule and Staff Report based on some of the comments received. Additionally, Staff met individually with the Sacramento Realtors Association on February 10, 2006, and with the Building Industry Association on July 12, 2006 to brief them on the proposed rule and the effect it would have on them. All associated comments and responses have been included in Appendix E of this Staff Report.

ENVIRONMENTAL REVIEW AND COMPLIANCE

Proposed Rule 417 does not create new requirements that may have an adverse effect on the environment. Pursuant to state CEQA Guidelines, the District's Environmental Coordinator finds that the adoption of the proposed rule is exempt from CEQA (Class 8 Categorical Exemption, Action by Regulatory Agencies for Protection of the Environment; §15308 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.

FINDINGS

The California Health and Safety Code, Division 26, Air Resources, requires local Districts to comply with a rule adoption protocol as set forth in Section 40727 of the Code. This section has been revised through legislative mandate to contain six findings that the District must make when developing, amending, or repealing a rule. These findings, effective January 1, 1992, and their definitions are listed in the table below.

Rule 417 – Required Findings

FINDING	FINDING DETERMINATION
Authority: The District must find that a provision of law or of a state or federal regulation permits or requires the District to adopt, amend, or repeal the rule.	The District is authorized to amend Rule 417 by California Health and Safety Code (HSC) Sections 40001, 40702, 40716 and 41010. [HSC Section 40727(b)(2)].
Necessity: The District must find that the rulemaking demonstrates a need exists for the rule, or for its amendment or repeal.	The District is required by HSC Section 39614 (SB 656) to adopt the most cost-effective local measures for controlling particulate matter from the list developed by CARB. Rule 417 implements several of the wood burning measures from the CARB list. [HSC Section 40727(b)(1)].
Clarity: The District must find that the rule is written or displayed so that its meaning can be easily understood by the persons directly affected by it.	The District has reviewed the proposed rule and determined that it can be understood by the affected parties. In addition, the record contains no evidence that people directly affected by the rule cannot understand the rule. [HSC Section 40727(b)(3)].
Consistency: The rule is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations.	The District has found that the proposed rule does not conflict with, and is not contradictory to, existing statutes, court decisions, or state or federal regulations. [HSC Section 40727(b)(4)].
Non-Duplication: The District must find that either: 1) The rule does not impose the same requirements as an existing state or federal regulation; or (2) that the duplicative requirements are necessary or proper to execute the powers and duties granted to, and imposed upon the District.	Subpart AAA of 40CFR Part 60 (Standards of Performance for New Residential Wood Heaters) sets standards for new wood heaters but does not apply to traditional fireplaces. Rule 417 does not duplicate the federal requirements because it requires any new wood burning appliance, including a fireplace, to conform to the federal emission standards. [HSC Section 40727(b)(5)].
Reference: The District must refer to any statute, court decision, or other provision of law that the District implements, interprets, or makes specific by adopting, amending or repealing the rule.	In adopting the proposed rule, the District is implementing the requirements of HSC Section 39614 (SB 656). [HSC Section 40727(b)(6)].
Additional Informational Requirements: In complying with HSC Section 40727.2, the District must identify all federal requirements and District rules that apply to the same equipment or source type as the proposed rule or amendments.	The matrix included in Appendix A compares Rule 417 to the applicable federal and District requirements. [HSC Section 40727.2].

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Appendix A
40727.2 Matrix for Proposed Amendments to Rule 417, Wood Burning Appliances

Elements of Comparison	Specific Provisions	Comparative Requirements	
		Proposed Rule 417	40CFR60 Subpart AAA
Exemptions		Cookstoves	Cookstoves
Averaging Provisions		none	none
Units		g/hr	g/hr
Emissions Limits		Catalytic Units: 4.1 g/hr Non-Catalytic Units: 7.5 g/hr	Catalytic Units: 4.1 g/hr Non-Catalytic Units: 7.5 g/hr
	Compliance alternatives	Pellet stoves, masonry heaters	none
Operating Parameters		Air-to-Fuel ratio less than 35-to-1	Air-to-Fuel ratio less than 35-to-1
Work Practice Requirements		none	none
Monitoring/ Records	Recordkeeping	none	none
	Frequency	None	none
Monitoring/ Testing	Test Methods	Wood Moisture Content, ASTM D4442-92	Test methods: -PM: Method 28 -Emissions Concentration, if a dilution tunnel sampling location uses: Method 5G -Emissions Concentration, if a stack location is used: Method 5H

**Appendix B
 SUMMARY OF PROPOSED AMENDMENTS**

Rule 417, Wood Burning Appliances

NEW SECTION NUMBER	EXISTING SECTION NUMBER	PROPOSED LANGUAGE
101	N/A	Sets the purpose of the rule to limit PM emissions from wood burning appliances.
102	N/A	Sets the rule applicability to anyone that manufactures, sells, installs, or operates a wood burning appliance.
103	N/A	Incorporates the District's standard severability language in case the rule is challenged in court.
110	N/A	Sets an exemption for gaseous fuel fired appliances that are certified to one of several ANSI standards.
111	N/A	Sets an exemption for cookstoves.
112	N/A	Sets an exemption from section 304 for commercial fire-starting products.
201	N/A	Sets the definition of a builder as any individual or company that constructs and/or sells any residential or commercial, single or multi-building unit with a wood burning appliance.
202	N/A	Sets the definition of a coating as a material which is applied to a surface and which forms a film in order to beautify and/or protect such surface.
203	NA	Sets the definition of a cookstove as described in 40 CFR 60.531.
204	N/A	Sets the definition of a fireplace as any permanently installed masonry or factory built device designed to operate with an air-to-fuel ratio greater than or equal to 35-to-1.
205	N/A	Sets the definition for garbage as any solid, semisolid, or liquid wastes generated from residential, commercial, and industrial sources, including trash, refuse, rubbish, industrial wastes, asphaltic products, manure, vegetable or animal solid or semisolid wastes, and other discarded solid or semisolid wastes.
206	N/A	Sets the definition of a manufacturer as any person who constructs or imports a wood burning appliance.
207	N/A	Sets the definition of a masonry heater as a permanently installed device constructed mainly of masonry materials with an enclosed chamber, a gas path through the internal heat exchange channels downstream of the firebox that includes at least one 180 degree change in flow direction before entering the chimney, and a large mass (> 1760 lb) designed to absorb and re-radiate heat.
208	N/A	Sets the definition of paints as any exterior and interior house and trim paints, enamels, varnishes, lacquers, stains, primers, sealers, undercoaters, roof coatings, wood preservatives, shellacs, and other paints or paint-like products.

NEW SECTION NUMBER	EXISTING SECTION NUMBER	PROPOSED LANGUAGE
209	N/A	Sets the definition of paint solvents as any organic solvents sold or used to thin paints or to clean up painting equipment.
210	N/A	Sets the definition of a pellet-fueled wood burning heater as any wood burning heater which is operated on pellet-fuel, and is either U.S. EPA Phase II certified, or exempted under U.S. EPA requirements set forth in Title 40 CFR, Part 60, Subpart AAA.
211	N/A	Sets the definition of permanently inoperable as modified in such a way that a device can no longer operate as a wood burning appliance.
212	N/A	Sets the definition of permanently installed as built or installed in such a manner that the device is attached to the ground, floor, or wall, and is not readily movable. A free standing stove that is attached to an exhaust system that is built into or through a wall is considered permanently installed.
213	N/A	Sets the definition of a retailer as any person engaged in the sale of wood burning appliances directly to the consumer.
214	N/A	Sets the definition of seasoned wood as wood of any species that has been sufficiently dried so as to contain 20 percent or less moisture by weight.
215	N/A	Sets the definition of solid fuel as any wood, non-gaseous, or non-liquid fuel.
216	N/A	Sets the definition of solvent as any liquid containing a volatile organic compound or combination of volatile organic compounds, which is used to perform cleaning or thinning of paints or coatings.
217	N/A	Sets the definition of treated wood as wood of any species that has been chemically impregnated, painted, or similarly modified to improve resistance to insects or weathering.
218	N/A	Sets the definition of U.S. EPA as the United States Environmental Protection Agency.
219	N/A	Sets the definition of U.S. EPA Phase II Certified as any appliance certified by the U.S. EPA to meet the performance and emission standards set forth in Title 40 CFR, Part 60, Subpart AAA.
220	N/A	Sets the definition of volatile organic compound as defined in Rule 101.
221	N/A	Sets the definition of waste petroleum product as any petroleum product, other than gaseous fuels, that has been refined from crude oil, has been used, and has been contaminated with physical or chemical impurities as a result of use.
222	N/A	Sets the definition of a wood burning appliance as any fireplace, wood burning heater, or pellet-fueled wood heater, or any similar enclosed device burning any solid fuel used for aesthetic or space-heating purposes, which has a heat input of less than one million British thermal units per hour (Btu/hr).

NEW SECTION NUMBER	EXISTING SECTION NUMBER	PROPOSED LANGUAGE
223	N/A	Sets the definition of a wood burning heater as an enclosed, wood burning appliance capable of, and intended for space heating as described in Title 40 CFR Section 60.531.
301.1	N/A	Prohibits the sale or installation of any wood burning appliance that is not U.S. EPA Phase II certified, a pellet-fuel stove, a masonry heater, or capable of meeting the emissions standards in 40 CFR 60, Subpart AAA.
301.2	N/A	Prohibits the sale or installation of any used, working wood burning appliance that does not meet the requirements of 301.1
301.3	N/A	Requires retailers to distribute wood burning information with the sale of each wood burning appliance.
302	N/A	Requires installation and operation of wood burning appliances to manufacturer's specifications. States that previously certified stoves modified out of manufacturer's specifications are not considered U.S. EPA Phase II certified.
303	N/A	Requires wood advertised as "dry" or "seasoned" to have a moisture content of 20 percent or less.
304	N/A	Prohibits burning of materials not intended for use as fuel by the manufacturer in new or existing wood burning appliances.
401	N/A	Requires manufacturers to demonstrate, upon request, that appliances subject to 301 meets the standards set forth in Title 40 CFR, Part 60, Subpart AAA.
501.1	N/A	Sets the test for air-to-fuel ratio as EPA Test Method 28A.
501.2	N/A	Sets the test for moisture content as ASTM Test Method D 4442-92.

Appendix C

Measures Adopted by Other Districts

District	Rule(s) Number	Control Measure
San Joaquin Valley Unified Air Pollution Control District	Rule 4901	Retailer Public Information and Mandatory Curtailment
		No new wood stove or wood burning fireplace insert unless it is EPA Phase II certified or is a pellet-fueled wood burning heater
		Upon sale or transfer of real property each wood burning heater must be EPA Phase II certified, a pellet fueled wood burning heater, permanently rendered inoperable, or removed.
		No wood burning fireplaces in new residential development with density greater than 2 dwelling units per acre. No more than 2 EPA Phase II certified wood burning heaters per acre in new development with density of ≥ 3 dwelling units per acre. No more than 1 wood burning fireplace or wood burning heater per dwelling unit in any new development with density ≤ 2 dwelling units per acre.
		Wood moisture content of 20% or less for seasoned wood, and Prohibited Fuel Types
Yolo-Solano Air Quality Management District	Rule 2.40	Retailer Public Information
		No new wood heating device unless it is EPA Phase II certified or equivalent (includes fireplaces)
		Wood moisture content of 20% or less for seasoned wood, and Prohibited Fuel Types
Great Basin Unified Air Pollution Control District – Town of Mammoth Lakes	Rule 431	Pollution Reduction Education Program and Mandatory Curtailment
		No new solid fuel burning appliance unless it is EPA Phase II certified (includes any fireplace or wood heater)
		Upon sale or transfer of a majority interest in any real property existing non-certified solid fuel appliances shall be replaced, removed, or rendered inoperable
		No more than 1 solid fuel appliance in any dwelling or nonresidential property
Tehama County Air Pollution Control District	Rule 4:27	Voluntary Curtailment
		No new wood heating device unless it is EPA Phase II certified (does not include fireplaces) and Fireplaces in new construction must either use EPA Phase II certified insert or meet <7.5 grams/hour of total particulate matter
		Prohibited Fuel Types
Feather River Air Quality Management District	Rule 3.17	Voluntary Curtailment
		No new wood heating device unless it is EPA Phase II certified (does not include fireplaces and wood cook stoves)

District	Rule(s) Number	Control Measure
Placer County Air Pollution Control District for Squaw Valley	Rule 225	No new wood heating device unless it is Oregon certified or <9 grams/hour for noncatalytic or <4 grams/hour for catalytic (does not include fireplaces)
		Installation and use of wood fired appliances (excludes fireplaces) shall be limited to one certified appliance per commercial or single family residential structure approved after 7/1/86, and wood fired appliances or fireplaces shall not be used in multiple unit residential developments approved after 7/1/86
Shasta County Air Quality Management District	Rule 3:23	Voluntary Curtailment
		No new wood heating device unless it is EPA Phase II certified (does not include fireplaces and wood cook stoves) and Fireplaces in new construction must either use EPA Phase II certified insert or meet <7.5 grams/hour of total particulate matter
		Prohibited Fuel Types
San Luis Obispo County Air Pollution Control District	Rule 504	Retailer Public Information and Voluntary Curtailment
		No new wood heating device unless it is EPA Phase II certified (includes fireplaces)
		Wood moisture content of 20% or less for seasoned wood, and Prohibited Fuel Types
Glenn County Air Pollution Control District		Voluntary Curtailment
		No new wood heating device unless it is EPA Phase II certified (does not include fireplaces) and Fireplaces in new construction must either use EPA Phase II certified insert or meet <7.5 grams/hour of total particulate matter
		Prohibited Fuel Types
Butte County Air Quality Management District	Rule 207	Retailer Public Information
		No new wood heating device unless it is EPA Phase II certified (includes fireplaces)
		Prohibited Fuel Types
City of Sebastopol	Chapter 15.70	Education Program and Voluntary Curtailment
		No new wood heating device unless it is EPA Phase II certified or is a pellet-fueled appliance or is a dedicated gas log fireplace or gas stove (includes fireplaces)
		Remove or replace non-certified units when interior remodel or renovation requires a building permit, the work exceeds \$3500, and the work is in the same room as the unit, and Effective June 1, 2005, it unlawful to use non-certified wood heaters within the City of Sebastopol except in the case of hardship. Effective June 1, 2007 non-certified wood heaters are no longer allowed for hardship cases which are sole source of heat, a temporary source of heat, or an inadequate alternative source of heat.
		Prohibited Fuel Types

District	Rule(s) Number	Control Measure
Kern County Air Pollution Control District	Rule 416.1	Retailer Public Information
		No new wood heating device unless it is EPA Phase II certified (does not include fireplaces)
		No person shall install a wood burning fireplace in a new residential subdivision which will consist of 20 or more dwelling units.

Appendix D

Rule 417, Wood Burning Appliances

Emissions Calculations and Cost Analysis

The baseline emissions for new units being constructed are based on historical usage patterns. Emissions are calculated as follows:

$$\text{Emissions} = (\text{Number of Homes Built}) \times (\text{fraction of homes w/ fireplaces}) \times (\text{fraction of homes w/ fireplaces that burn}) \times (\text{Average amount of wood burned per home}) \times (\text{EF}_{\text{burning}})$$

The emissions for both cord wood burning and manufactured logs are calculated for the total emissions.

The reduction in emissions is calculated for the different compliance options. The emissions for aesthetic use are based on matching the burn time for fires that would have been lit. The burn time is calculated as

$$\text{Burn Time} = (\text{Total amount of wood that would have been burned}) \div (\text{Burn Rate of wood})$$

The emissions for the controlled burning are calculated as

$$\text{New Emissions}_{\text{aesthetic}} = (\text{Burn time}) \times (\text{EF}_{\text{controlled burning by time}})$$

The emissions for heating use are based on matching the useable heat that would have been generated by the fires lit. The amount of heat generated is calculated as

$$\text{Heat Output} = (\text{Total amount of wood that would have been burned}) \times (\text{Heat content of Wood}) \div (\text{Thermal Efficiency of Fireplace})$$

The emissions for the controlled burning are calculated as

$$\text{New Emissions}_{\text{heat}} = [(\text{Heat Output} \div \text{Thermal Efficiency}_{\text{controlled burning}}) \div (\text{Heat content of Wood})] \times (\text{EF}_{\text{controlled burning by time}})$$

The total emissions reduction is based on the percentage of each compliance method used. The District has assumed compliance percentages for the purposes of calculating emissions and costs. The emissions reduction is calculated as

$$\text{Emissions Reduction} = (\text{Emissions}) - [(\text{New Emissions}_{\text{certified stove aesthetic}} \times \text{fraction of adoption}) + (\text{New Emissions}_{\text{certified stove heat}} \times \text{fraction of adoption}) + (\text{New Emissions}_{\text{NG aesthetic}} \times \text{fraction of adoption}) + (\text{New Emissions}_{\text{NG heat}} \times \text{fraction of adoption}) + (\text{New Emissions}_{\text{electric aesthetic}} \times \text{fraction of adoption}) + (\text{New Emissions}_{\text{electric heat}} \times \text{fraction of adoption})]$$

The cost for compliance with this rule is the difference between the added cost of installation of the equipment to comply with the rule and the saving due to reduced fuel usage. The cost of installation is the additional cost of the equipment over a traditional fireplace, taking into account the different percentage of each type of unit to be installed. The total cost of all the units installed is amortized over the expected life of the unit, which is estimated at 15 years, using the capital recovery equation. A 7% interest rate is assumed in the equation and the assumption will be made that the equation has no salvage value at the end of the fifteen-year cycle.

$$\text{Annualized Capital Cost: } A = \frac{[P * i(1+i)^n]}{[(1+i)^n - 1]}$$

Where:

A	=	Annual Cost
P	=	Present Value
i	=	Interest Rate (7%)
n	=	Equipment Life (15 years)

The fuel cost savings for the compliant equipment is calculated as the difference between the cost of wood for traditional fireplaces and the cost of fuel for the compliant options. The cost of wood includes the fact that a percentage of wood is obtained at no cost. The cost of NG includes the assumption that the NG heater will not be fired at full capacity for aesthetic use due to the increased heat output. There is no cost assumed for aesthetic use of electric fireplaces, since they are basically light appliances in that capacity. The cost savings is calculated as

$$\text{Cost Savings} = (\text{Total amount of wood that would have been burned} \times \text{cost of wood}) - [(\text{Cost of Wood}_{\text{certified stove aesthetic}} \times \text{fraction of adoption}) + (\text{Cost of Wood}_{\text{certified stove heat}} \times \text{fraction of adoption}) + (\text{Cost of NG}_{\text{aesthetic}} \times \text{fraction of adoption}) + (\text{Cost of NG}_{\text{heat}} \times \text{fraction of adoption}) + (\text{Cost of Electricity}_{\text{heat}} \times \text{fraction of adoption})]$$

The total cost is

$$\text{Total Cost} = (\text{Annualized Capital Cost}) - (\text{Cost Savings})$$

The cost effectiveness of the rule is

$$\text{Cost Effectiveness} = (\text{Total Cost}) \div (\text{Emissions Reduction})$$

The variables used and the calculations are summarized in the following tables:

Wood Burning Statistics & Information			
Information			Source
New Residence Construction	20000	Units per year	Nevin, 2006
Total Residences	502142	Units	SACOG Projections 12/16/04
% of Homes w/ fireplace	39%		Houck, 2003
% of Homes w/ fireplace that burn wood	71%		Houck, 2003
% of Homes w/ fireplace that burn Manufactured logs	35%		Houck, 2003
% of New Home w/fireplace installing NG	60%		John Crouch, HPBA
Average Wood Usage Per Household that burns wood	0.92	cord/home	Houck, 2003
Average Manufactured Log Use Per Household that burns wood	19	Log/yr	Houck, 2003
Percent of Wood that is Purchased	51.4%		Houck, 2003
Heating Value of Wood	6,050	Btu/lb	Representative of Certified Units
Heating Value of Manufactured Log	15,700	Btu/lb	Houck, Wax-Sawdust Firelogs
Uncontrolled Fireplace EF	34.6	lb PM ₁₀ /ton of wood	AP 42 1.9
Controlled (non-catalytic) Fireplace EF	14.6	lb PM ₁₀ /ton of wood	AP 42 1.10
Manufactured Log EF	10.7	lb PM ₁₀ /ton of log	Houck, Wax-Sawdust Firelogs
NG PM10 EF	0.007	lb/MMBtu	AP 42 1.4
Thermal Efficiency Fireplace	7%		Houck, 1998
Thermal Efficiency Certified Fireplace	63%		Representative of Certified Units
Thermal Efficiency NG Fireplace	75%		Houck, 1998
Incremental Cost to install Certified Fireplace Insert	\$ 2,500.00		John Crouch, HPBA
Incremental Cost to install NG Fireplace Insert	\$ 500.00		John Crouch, HPBA
Incremental Cost to install Electric Fireplace	\$ 400.00		John Crouch, HPBA
Cost of Wood (per Cord)	\$ 215.00		Staff Survey
Cost of Manufactured Log (per Log)	\$ 3.00		Staff Survey
Cost of NG (\$/MMBtu)	\$ 18.40		Staff Survey
Cost of Electricity (\$/kWh)	\$ 0.08		Staff Survey
Burn Rate of Wood in Fireplace	6.60	lb/hr	Houck, 1998
Burn Rate of Manufactured Log in Fireplace	3.00	hr/log	Houck, Wax-Sawdust Firelogs
Median Burn Rate Certified Fireplace Insert	3.16	lb/hr	Representative of Certified Units
Heat Input Rate NG Insert	30,000	BTU/hr	Staff Survey
Volume Cord of Wood (exluding void space)	79	ft ³ /cord	EIIP
Density of Pacific Hardwood	24	lb/ft ³	EIIP
Weight of Manufacuted Log	4.95	lb/log	Broderick, 2003

New Residence Construction	20000	Units per year	Aesthetic Use	56%
			Heating Use	44%
Expected Compliance Option	No fireplace	Certified Stove	Natural Gas Stove	Electric Fireplace
%	61%	15%	23%	1%
# total	12200	3000	4600	200
Capital Cost (Annualized, total)		\$ 823,459.69	\$ 252,527.64	\$ 8,783.57
Total Fuel (Aesthetic)		\$ (90,550.84)	\$ (42,513.17)	\$ (10,319.13)
Total Fuel (Heating)		\$ (110,300.98)	\$ (158,641.32)	\$ (6,954.01)
Total Fuel		\$ (200,851.82)	\$ (201,154.48)	\$ (17,273.14)
Total Cost		\$ 622,607.87	\$ 51,373.15	\$ (8,489.57)
Unit Uncontrolled Emissions (lb/yr)		21.6	21.6	21.6
Unit Controlled Emissions (lb/yr)		3.2	0.0	0.0
Unit Reduction (lb/yr)		18.4	21.6	21.6
Total Uncontrolled Emissions (lb/yr)		64806	99369	4320
Total Controlled Emissions (lb/yr)		9463	90	0
Total Reduction (lb/yr)		55343	99279	4320
Percent Reduction		85.4%	99.9%	100.0%
Overall Cost Effectiveness (\$/ton)		\$ 22,499.82	\$ 1,034.92	\$ (3,929.99)
Overall Cost Effectiveness (\$/lb)		\$ 11.25	\$ 0.52	\$ (1.96)
				\$ 4.19
				\$ 8,373.97
				\$ 665,491.45
				168,496
				9,553
				158,943
				20000
				100%

Appendix E Public Comments

Written Comments

Hearth, Patio & Barbecue Association (HPBA) (August 2, 2006)

- Comment #1:** The definition of a fireplace should be amended to include the following alternatives: a burn rate over 5 kilograms per hour, or over 800 kilograms in weight.
- Response:** Staff has modified the definition of a fireplace to include the alternatives.
- Comment #2:** The definition of a masonry heater should be changed to include the ASTM E 1602-03 definition.
- Response:** Staff has modified the definition of a masonry fireplace to reference ASTM E 1602-03.
- Comment #3:** The definition of permanently inoperable is not germane to this rule.
- Response:** Permanently inoperable is an exemption condition from the prohibition of sale for used appliances, and therefore needs to be defined.
- Comment #4:** HPBA does not understand the nexus between the prohibition of new fireplace installations and the woodsmoke problem in Del Paso Manor. The staff report should also reflect that this rule will have very little impact on production homes, since over 90% of the new homes built in the county are currently constructed with gas fireplaces.
- Response:** The purpose of this rule is not to reduce the woodsmoke only in Del Paso Manor. Woodsmoke consists mostly of PM_{2.5}, and can exist throughout the county, and reductions are therefore targeted county wide.
This rule will require that no new traditional fireplaces are installed anywhere in the county in the future because these appliances emit up to ten times more PM than an EPA Phase II Certified appliance. Current building trends are subject to change. Part of the current trend in new construction is due to other land use efforts of the District and local jurisdictions. This rule also serves to reinforce those efforts.
- Comment #5:** Section 301.1(d) should be changed to include the possibility of

including a new clean burning fireplace.

Response: While the staff is aware of the efforts to develop a clean burning fireplace standard, the standard is not currently available for evaluation. Staff therefore cannot recommend the inclusion of the standard in the rule at this time. When the standard is finalized, the staff will evaluate whether the rule should be reopened to include it.

Comment #6: HPBA is concerned that section 301.2 encouraged consumers to “render permanently inoperable” all wood burning appliances. They suggest that the rule language focus this section on antique woodstoves.

Response: The section noted does not require people to render permanently inoperable all wood burning appliances. This section is intended to prohibit all old used devices from being transferred or imported if they are capable of polluting Sacramento air in some new location. It will allow stoves, which may have visual appeal even if unused, to be sold or transferred. Therefore, it requires that upon sale, used non-certified devices be made permanently inoperable.

Comment #7: HPBA is concerned that section 301.3 would force their retailers to find information to distribute. They also state that definitive information on proper sizing is not available.

Response: The District will be producing and providing educational information for distribution. The requirements laid out in this section are for anyone who wishes to use other material. Staff has removed the sizing requirement.

Comment #8: The requirement (Section 401) that a manufacturer submit information directly to the APCO is burdensome and duplicative.

Response: This requirement (Section 401) does not require all manufactures to submit information on all appliances. This requirement ensures that the District can obtain this information in the event that other means of compliance with standards (for example EPA Certification) is not otherwise available.

Comment #9: HPBA supports regulations that encourage the removal and destruction of uncertified woodheaters. They regret that this rule does not address this issue more directly.

Response: This rule only implements the first phase of control possible for residential wood burning. Additional rulemaking dealing with replacement of non-certified units upon sale of property is being considered. Additionally, the District encourages the removal and replacement of older devices, and is sponsoring a change-out

program for uncertified devices, with monetary incentives.

Comment #10: HPBA supports full enforcement of any provision of a rule, particularly as it pertains to seasonal retailers, such as large home centers.

Response: The District will fully enforce all provisions of this rule, including the sales provision at seasonal retailers and large home centers.

Natural Pest Control and Firewood (NPC) (August 11, 2006)

Comment #1: The media will spread the message that the District has restricted the use of wood in homes and barbecues.

Response: While the District cannot control the media, the District often has opportunities to respond to media requests. If given the opportunity, the District will convey the proper message.

Comment #2: Wood is an abundant, local energy source that reduces dependence on foreign energy sources and has a net zero effect on carbon dioxide emissions. The District should include a statement of intent recognizing the contribution of wood to energy, and stating that the District is not intending to curtail the use of wood for heat or barbecues.

Response: This rule does not prohibit the burning of wood. This rule does not affect cookstoves or portable barbecues. Staff is still evaluating other wood burning measures.
This rule does not address carbon dioxide emissions.

Comment #3: When I deliver seasoned wood to customers, many store them in ways that it will get wet when it rains. The District should compel homeowners to keep the wood dry.

Response: Staff recognizes that wet wood can be an issue, and will work to educate and encourage the public to take steps to keep their wood dry. This rule does not include measures to prohibit burning wet wood, so a requirement to keep wood dry is not included.

Duraflame (August 14, 2006)

Comment #1: Duraflame believes the estimate of an approximate 5% reduction in PM from wood smoke is overstated, in contrast to the San Joaquin Valley APCD estimate of 1-2% reduction.

Response: There is a key difference between Rule 417 and San Joaquin's rule that affect the different reductions. San Joaquin's rule still

allows for the installation of traditional fireplaces, which would lead to a smaller reduction. Additionally, San Joaquin's calculations are based on the projected growth of the emissions inventory. The District's calculations are based on projected regional growth in housing construction and Sacramento specific surveys of wood burning use.

Comment #2: The principal measure to ban installation of wood burning fireplaces in new homes is unnecessary and will have very little impact on reducing emissions from residential wood combustion.

Response: Part of the purpose of this rule is to limit the growth of emissions from residential wood smoke. Given that the region will most likely be in non-attainment for the new Federal PM2.5 standard and is already in non-attainment for State PM2.5 standards, the District is pursuing all available particulate emissions reductions. Staff calculations estimate a yearly reduction 158,943 pounds of PM as result of this rule.

Comment #3: Duraflame advocates implementing episodic controls first, then implementing new installation restrictions if needed.

Response: The District is currently implementing a wintertime Spare the Air program for voluntary curtailment on the worst days, before the major provisions of this rule become active. Mandatory curtailment is being examined for possible implementation at a future date.

Comment #4: Section 112 should be modified to specifically include manufactured firelogs.

Response: The exemption in Section 112 applies to Section 304, which includes a prohibition of materials not intended by the manufacturer for use as solid fuel in a solid fuel burning appliance. Since manufactured firelogs are intended for use as fuel in a solid fuel burning device, Section 304 would not apply to them. Therefore, staff feels it is unnecessary to include this specific exemption.

Comment #5: Section 301.1(d) should be changed to include the possibility of including the new clean burning fireplace.

Response: See response to comment #5 from HPBA.

Comment #6: Duraflame supports public awareness programs to educate citizens on how to reduce emissions from burning wood. Duraflame feels such information should include the use of manufactured logs as a cleaner burning method.

Response: Staff is currently reviewing the studies, in particular the

appropriateness of a comparison of a large wood fire versus one manufactured log, specifically to use in the Sacramento area, to estimate the relative benefits or adverse impacts from the use of manufactured logs. This effort is ongoing and the results will be reflected in public information made available six months after rule adoption.

Comment #7: Duraflame supports an episodic, two stage curtailment with an exemption for clean burning devices from a voluntary first stage curtailment.

Response: See response to comment #3 from Duraflame.

Comment #8: Duraflame recommends a density restriction that would allow for the installation of some traditional fireplaces, as well as an exemption for any clean burning device.

Response: There have not been studies to substantiate appropriate density level restrictions. Therefore, in order to achieve the maximum reduction from the ban of new installations of fireplaces, staff has recommended an effective density restriction of zero for traditional fireplaces. The rule as proposed does not include any type of density restrictions for the types of appliances allowed. Even without these provisions, the rule has relatively low cost compared to other District rules. Therefore, staff does not recommend use of density restrictions. This does not include any new clean burning fireplace standard that may arise in the future. See response to comment #5 from HPBA for further discussion.

Comment #9: The District should consider the growth in greenhouse gases from the use of natural gas as a result of this rule. Has the District considered what a significant increase in natural gas use could do to strain supplies and the increased release of greenhouse gases?

Response: Staff estimates natural gas use for this rule would increase by 12 MMscf per year, or approximately a 0.06% increase in residential natural gas use for Sacramento (based on installation of 4600 natural gas stoves in place of traditional fireplaces). On a useful heat basis, the use of wood in a traditional fireplace releases 2.3 times more CO₂ than natural gas.

Public Workshop Comments (August 14, 2006)

Comment #1: How will this rule be enforced, especially for things like seasoned wood and installation of devices?

Response: Staff will be responsible for enforcement, including random

inspections of new construction to ensure only compliant appliances are being installed. The seasoned wood provision will be enforced on a complaint basis.

Comment #2: Who will be responsible for testing seasoned wood?

Response: The District will be responsible for testing wood available at retailers and wholesalers to determine moisture content if it is deemed necessary.

Comment #3: What if the wood gets wet? Especially since the majority of the wood is bought in the winter.

Response: Any wood testing would be done on a representative sample, so the wettest piece of wood on the top of the pile would not be a good candidate for testing. Additionally, the entire piece is not likely to absorb water in one rain event. In the event of a continual rain event, enforcement would take the conditions into consideration. If all else fails, the wood could be sold as unseasoned, since this rule does not prohibit the sale of unseasoned wood.

Comment #4: My neighbor burns pressure treated wood. Is this against regulation? What should I do?

Response: Burning pressure treated wood would be a violation of section 304, if adopted. Depending on the exact material, such wood may also contain a federally listed hazardous material, which cannot be burned. You may direct a complaint to District enforcement staff, which will take appropriate action.

Comment #5: Is your study for the City of Sacramento? How does wood particulate matter compare to diesel truck particulates and pollution generated in other areas?

Response: The study in question (wintertime PM2.5 emission by source) represents information for the county of Sacramento. It shows that 44% of wintertime PM2.5 emissions are the result of woodsmoke. In comparison, motor vehicle emissions, of which diesel trucks are a subset, accounts for 6%.

Comment #6: Are these figures yearly? Who did this study?

Response: This information represents the average daily wintertime PM2.5 emissions. This information is based on emission inventory data, and may be found at the following website: Forecasted Emissions by Summary Category CCOS Domain Planning Projections (http://www.arb.ca.gov/app/emsmv/ccos/fcemssumcat_cc212.php)

Comment #7: I don't remember the wood smoke levels being this high on the

ARB inventory.

Response: This information represents the average daily wintertime PM2.5 emissions. The commenter may have been looking at the annual average, which would have lower numbers.

Comment #8: Many tests, including ones from the EPA, show that Duraflame logs burn cleaner than firewood and their use should be encouraged. Duraflame supports regulation of wood smoke due to the high levels of PM in the winter. Public information is vital to wood smoke regulation. Episodic controls, such as mandatory/voluntary no burn days and public education have been shown to be the best way to achieve reductions. The order of this regulation against wood smoke is wrong. Prohibiting open fireplaces should come after public education and episodic controls. You should also specify that commercial logs are cleaner burning than regular firewood. We are eager to work with the district on the public education side of this regulation. We are disappointed that the promotion of commercial logs as a cleaner burning fuel is not included in the staff report. It has been show that commercial logs burn 2/3 cleaner than firewood.

Response: See responses to comments from Duraflame letter (8/14/06).

Comment #9: When will this program start?

Response: The first provisions of the rule (advertising requirement, prohibition of garbage burning, prohibition of selling used, noncompliant appliances) would start upon adoption of the rule, scheduled for September 28, 2006. The distribution of educational material would be effective six months after adoptions, and the prohibition of installation of non-compliant appliances would be effective one year after adoption.

Comment #10: Will there be variations of no-burn that you are recommending such as only burning seasoned wood or less amounts of wood?

Response: The exact message for voluntary curtailment for Spare the Air is still being formulated. Staged curtailment with different levels of restrictions based on the Air Quality Index (AQI) is being examined as a possible message.

Comment #11: Will these recommended no-burn days be based on individual testing locations? Will the recommended no burn days be based on meteorology or testing results?

Response: The forecasting of the AQI is based on a mix of both meteorological and monitoring data. The monitoring sites are located throughout the Sacramento region, with 3 sites within

Sacramento county.

Comment #12: What is the web site address?

Response: The Districts web site is www.airquality.org. Spare the Air information can be found at www.sparetheair.org.

Comment #13: Will the state of the inversion layer affect the PM levels?

Response: Inversions layers are one factor that can affect PM levels.

Comment #14: I am a firewood dealer owning two locations in Sacramento County. I circulated a one page briefing about the proposed rule to other firewood dealers and potentially affected sources in the area. The main concern is that this rule will cause the "alarmists" to think that all wood burning has been banned. I will read from a letter that I have sent to the staff...[reads letter]...There are 25 million trees in the surrounding areas that can eventually be used as fuel. The media will take this rule and make it seem like wood burning has been banned. This will cause a freeze in the firewood sales and this abundant local fuel source will go unutilized. Because of this, our dependency on foreign fuels will increase, creating more problems. Our President has stated that our dependence on foreign fuels must be greatly reduced. My company has delivered 25 to 30 million cords of wood to the residents of this area. My customers put their wood under awnings of their house and out in the open. When it rains, the wood collects water from being in the open or from the roof runoff of the house. Because the wood I sell gets wet, this rule may accuse me of selling noncompliant wood. Only a small percentage of the people who buy wood store it properly. There should be a provision in this rule to allow for someone to choose to install an open fireplace if they keep their wood in a wood shed and only burn wood with 20% or less moisture. The real problem is not the fireplaces themselves, but the people burning wet wood. My wood, if stored properly, creates very little smoke as compared to wet wood. I have not heard anyone once promote the use of dry wood or the proper storage of firewood. You must educate the public on proper wood burning methods and you must state in the rule language and make it clear that wood burning is allowed so the media does not run away with it.

Response: See responses to comments from NPC letter (8/11/06).

Comment #15: I have wood in my commercial wood yard but don't have a wood shed. I take the necessary efforts to keep the wood dry such as storing it on a pallet, but still the top layer of wood does get wet and it would not test compliant as seasoned wood.

Response: Any wood testing would be done on a representative sample, so

the wettest piece of wood on the top of the pile would not be a good candidate for testing. Additionally, the entire piece is not likely to absorb water in one rain event. In the event of a continual rain event, enforcement would take the conditions into consideration. If all else fails, the wood could be sold as unseasoned, since this rule does not prohibit the sale of unseasoned wood.

Comment #16: I see no problem with an open fireplace as long as wood is dry and burned properly. Additionally, a fireplace insert is like a piece of jewelry, where people are very particular about the style, color, material, and overall look of the insert that they have. Because people are so particular about their wood burning inserts, it will encourage builders to install gas inserts. I think builders should be allowed to create a placeholder for an insert. That way the buyer can choose and install the insert that they want.

Response: Emissions from open fireplaces are much greater than certified appliances. On an equivalent heat basis, the emissions can be as much as ten times greater. Therefore, the District is seeking to prevent the growth of this emissions source in favor of cleaner technology. There is nothing in the rule to prevent builders from offering any of the compliant wood burning appliance options (EPA Phase II Certified wood burning heaters, pellet stoves, or masonry heaters).

Comment #17: Gas inserts will definitely be the most prevalent appliance installed in new development. Has the District considered the price of natural gas and the possibility of the cost increasing drastically in the future? Most builders will comply with the rule by installing gas inserts due to differences in price.

Response: See response to written comment # 9 from Duraflame. Cost estimates were base on fuel prices in early 2006. While market forces may cause prices to change, all available fuels are subject to change.

Comment #18: It will also encourage the installation of pellet stoves. The pellets for these stoves are manufactured in Canada, which would increase our foreign fuel demand.

Response: Pellet stoves are just one of the cleaner options available for burning wood.

Comment #19: An open fireplace can be clean burning if the person is burning the right kind of fuel.

Response: Emissions from open fireplaces are much greater than certified appliances. On an equivalent heat basis, the emissions can be as much as ten times greater. Therefore, the District is seeking to

prevent the growth of this emissions source in favor of cleaner technology.

Comment #20: Will people be able to use pollution credits instead of complying with the rules?

Response: There is no option in this rule that allows for the exchange of emission credits for the installation of traditional fireplaces.

Comment #21: Firewood is recognized as the only fuel source that has a net zero CO₂ emission. Natural gas produces much more CO₂ than wood ever will.

Response: See response to written comment #9 from Duraflame.

Comment #22: How will the incentive program be implemented? How will you decide who will get the incentives? Is it based on need?

Response: A separate incentive program will target low income residents. For details of the incentive program, please refer to the District website (<http://www.airquality.org/woodstove/index.shtml>).

Comment #23: How much does a clean wood burning insert cost?

Response: A basic certified wood burning stove/insert starts at \$1500.

Comment #24: How will this voucher program offset the costs of an EPA certified wood burning insert? Chances are it won't even cover 50% of the cost. Additionally, you are starting this incentive program at the beginning of wood burning season when costs of inserts are high.

Response: The incentive will have multiple phases and is an ongoing program which will be adjusted as it develops. For details of the incentive program, please refer to the District website (<http://www.airquality.org/woodstove/index.shtml>).

Comment #25: I am glad you are making an effort to reduce wood smoke. I know when it is a cold winter day by the smell of wood smoke in the air. I very much support the actions of the district.

Response: Comment noted.

Comment #26: My main requests are that a preface is put into the rule that states that the rule is not a ban on wood burning and that some public education is done to show the effects of burning wet wood and how to store wood properly. Wood should be stored on pallets above ground or in a wood shed. Many people try wrapping wood in plastic to keep it dry but this method will cause mold and mushrooms to grow on the wood, which is harmful if burned.

- Response:** See response to comment #3 from NPC. Proper method of wood storage will be included in the District's educational efforts.
- Comment #27:** ARB has put out an advice manual on proper wood burning and storage and some of the techniques you have talked about should be incorporated into this manual.
- Response:** Comment noted.
- Comment #28:** How does this affect new subdivisions?
- Response:** The primary effect on new subdivisions will be the prohibition of the installation of new, traditional fireplaces.
- Comment #29:** Are there any density restrictions? Clarify why you decided to go with the proposed rule first instead of a density restriction?
- Response:** See response to written comment #8 from Duraflame.
- Comment #30:** How long have you been working on this rule?
- Response:** This rule is in part a response to SB 656, for which the District adopted an implementation schedule on July 28, 2005. This rule has been in active development since January 2006.
- Comment #31:** What if someone is burning wet wood? Could the District stop them? How would the process work?
- Response:** This rule does not include measures to prohibit burning wet wood. The District will actively engage in education to inform the public of the negative effects of burning wet wood. Additionally, any particular nuisance complaints can be directed to the District for follow-up.