

# Regulation 6: Particulate Matter and Visible Emissions, Rule 3: Wood Burning Devices

---

## Proposed Amendments

September 18, 2015

Prepared by:

*Tracy Lee, Air Quality Specialist II*

Reviewed by:

*John Marvin, Air Quality Program Manager*

*Juan Ortellado, Air Quality Program Manager*



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT



# TABLE OF CONTENTS

<b>I.</b>	<b>EXECUTIVE SUMMARY</b>	<b>4</b>
<b>II.</b>	<b>BACKGROUND</b>	<b>6</b>
	A. Health Hazards of PM <sub>2.5</sub>	
	B. Wintertime Atmospheric Conditions and PM Levels	
	C. Source Description - Wood Burning Devices	
	D. EPA-Certified Wood Heater Requirements	
<b>III.</b>	<b>PM<sub>2.5</sub> EMISSIONS FROM WOOD SMOKE</b>	<b>10</b>
	A. Winter Sources of PM <sub>2.5</sub> Emissions	
	B. Emissions from Wood Burning Devices by County	
	C. Regional PM <sub>2.5</sub> Exceedances	
<b>IV.</b>	<b>PUBLIC EDUCATION, OUTREACH, AND INCENTIVES</b>	<b>13</b>
	A. Winter Spare the Air Program	
	B. Incentive Program	
<b>V.</b>	<b>PROPOSED RULE AMENDMENTS</b>	<b>14</b>
	A. Sole Source of Heat Exemption	
	B. Exemption for Non-functional, Permanently Installed Heater	
	C. Exemption for Loss of Natural Gas and/or Electric Power	
	D. Clarify, Amend, or Add Definitions to Rule	
	E. U.S. EPA Requirements for Residential Wood Heaters	
	F. Requirement for Sale, Resale, Transfer or Installation of Wood-Burning Devices	
	G. Visible Emissions Limitation	
	H. Real Estate and Rental Disclosure Requirements	
	I. Requirement for Rental Properties	
	J. Requirement for New Building Construction	
	K. Requirement for Fireplace or Chimney Remodels	
	L. Registration Requirement	
	M. Mandatory Burn Ban	
<b>VI.</b>	<b>EMISSION REDUCTIONS</b>	<b>19</b>
	A. Sole Source of Heat Exemption	
	B. Requirement for Rental Properties	
	C. Requirement for New Building Construction	
	D. Ancillary Emission Reductions	

<b>VII. ECONOMIC IMPACTS</b>	<b>22</b>
A. Sole Source of Heat Exemption and Registration	
B. Requirement for Rental Properties	
C. Requirement for New Building Construction	
D. Air District Staffing Impacts	
E. Incremental Costs	
<b>VIII. SOCIOECONOMIC IMPACTS</b>	<b>28</b>
<b>IX. ENVIRONMENTAL IMPACTS</b>	<b>28</b>
<b>X. REGULATORY IMPACTS</b>	<b>29</b>
<b>XI. RULE AMENDMENT PROCESS</b>	<b>29</b>
<b>XII. CONCLUSION</b>	<b>30</b>
<b>XIII. REFERENCES AND NOTATIONS</b>	<b>32</b>

## I. EXECUTIVE SUMMARY

The Bay Area Air Quality Management District (“Air District”) is proposing amendments to Regulation 6, Rule 3: Wood Burning Devices (“Rule 6-3”). The purpose of the amendments to Rule 6-3 is to further reduce emissions of fine particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub> or “fine particulate”) and visible emissions from wood-burning devices used as a source of primary or supplemental heat, or for ambiance.

In the wintertime, wood burning is a major contributing source of PM<sub>2.5</sub> concentration in the Bay Area and wood smoke contributes approximately 30 to 40 percent of PM<sub>2.5</sub> concentrations. Because of the topography and wintertime weather patterns in the Bay Area, and the large number of households burning wood in the region, PM<sub>2.5</sub> concentration can build and result in unhealthy air quality.

Since the adoption of Rule 6-3 in 2008, the Air District has implemented multiple strategies to reduce PM<sub>2.5</sub> emissions from residential wood burning in the Bay Area through a robust enforcement program. In addition, a comprehensive public education and outreach effort outlining the harmful effects of wood smoke has resulted in reduction of wood burning by Bay Area residents. Although Rule 6-3 has successfully reduced wintertime PM<sub>2.5</sub> emissions by about 2,660 tons per year (tpy), wood smoke continues to cause unhealthy air, to exceed the PM<sub>2.5</sub> federal health standard, and negatively impact local air quality.

The United States Environmental Protection Agency (EPA) under the authority of the Clean Air Act (42 U.S.C. 7401 et seq.), established the National Ambient Air Quality Standards (NAAQS) to protect human health with a margin of safety from adverse health impacts due to exposure to air pollution. The proposed amendments to Rule 6-3 would help the Bay Area achieve the state and federal ambient air quality standards for PM<sub>2.5</sub>. It is estimated that the Air District’s proposed amendments would reduce PM<sub>2.5</sub> emissions by 321 tpy and further improve local and regional air quality in the Bay Area.

The proposed rule amendments would:

- clarify and strengthen the requirements for claiming exemptions;
- adopt new wood heater standards set forth by EPA;
- strengthen the visible emissions limitation;
- require real estate and rental disclosures to communicate the health hazards of PM<sub>2.5</sub>; and
- transition new building construction and rental properties to cleaner heating options.

In preparing these proposed amendments, Air District staff reviewed similar regulations in other air districts and consulted with interested stakeholders such as the Hearth, Patio and Barbecue Association; Bay Area Realtor Associations; California Apartment Association; American Lung Association; Families for Clean Air; and any interested

members of the general public. Nine public workshops were conducted in March and April 2015 to discuss the proposed amendments to the rule and comments from those meetings have been incorporated into this draft proposal.

Potential environmental impacts from the proposed rule amendments were reviewed by the Air District's environmental consultant, Environmental Audit, Inc. An evaluation of the proposed amendments conclude that there would be no significant adverse environmental impact, and as a result, staff proposes the adoption of a California Environmental Quality Act (CEQA) Negative Declaration.

A socioeconomic analysis on the proposed rule amendments was conducted by Bay Area Economics. The findings of that analysis indicate there are no significant economic impacts resulting from changes on the household, landlord or renters to transition to cleaner heating options; however with strengthened rule requirements that further reduce wood-burning by 20% in the Bay Area, there may be a significant economic burden to small businesses selling wood.

## II. BACKGROUND

Rule 6-3 is different from other Air District rules that regulate sources of air pollution in that the success of Rule 6-3 depends heavily on the cooperation and participation of residents living in the nine Bay Area counties, rather than on industrial sources. This rule is especially challenging because burning wood is a wintertime tradition and can evoke a certain amount of nostalgia for some people; however, the fine particulates that are generated by the burning of wood can impact health both regionally and locally.

### A. Health Hazards of PM<sub>2.5</sub>

The nine counties that surround San Francisco Bay are home to almost seven million residents and an estimated 1.4 million fireplaces and wood stoves. These fireplaces and wood stoves generate fine particulates, are the leading source of air pollution in the wintertime, and can cause serious health consequences for Bay Area residents.

The act of burning wood dates to the beginning of human history and was thought to have a benign impact on human health. However, it is now understood that smoke from residential wood-burning devices contains harmful particle pollution, also known as “fine particulate matter” or PM<sub>2.5</sub>, along with other pollutants, including carbon monoxide, volatile organic compounds (VOCs), black carbon, and air toxics such as benzene. Burning wood can increase PM<sub>2.5</sub> pollution to levels that pose serious health concerns, and in most areas, residential wood smoke constitutes the majority of the particle pollution problem during winter months.

Fine particles contain microscopic solids or liquid droplets that are so small that they can penetrate deep into the lungs and cause serious health problems. People with respiratory illnesses, children, and the elderly are more sensitive to the effects of PM<sub>2.5</sub>, but it can affect everyone. Numerous scientific studies have linked PM<sub>2.5</sub> exposure to a variety of health issues, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing. However, healthy people also can experience temporary symptoms from exposure to elevated levels of particulates in addition to these more serious health issues.<sup>1</sup>

### B. Wintertime Atmospheric Conditions and PM Levels

The Bay Area’s PM<sub>2.5</sub> formation is influenced by the local atmospheric conditions, geographical distribution of wood-burning sources, and air exchange with neighboring air basins. The highest PM<sub>2.5</sub> levels occur from November through February, when less frequent vertical atmospheric mixing occurs in combination with decreased surface wind speeds. Horizontal mixing and surface winds are key to dispersing particulates in the atmosphere and keeping ambient concentrations below the PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS). Winter meteorological conditions along with topographic features that further limit mixing cause PM<sub>2.5</sub> levels to build up to unhealthy levels in the Bay Area.

Air District analyses show that wind patterns can transport particulates from one location to another within the Bay Area air basin, and from other air basins into the Bay Area, resulting in increased PM<sub>2.5</sub> levels.<sup>2</sup> For example, a ridge of high pressure that settles over northern California for multiple days will cause overnight temperature inversions to form, trapping particulates near the surface. Over a period of several days, these pollutants will accumulate, resulting in elevated PM<sub>2.5</sub> levels. As high pressure continues to build, light winds can move the particulates from one area to another, increasing these impacts.

**C. Source Description – Wood-Burning Devices**

Emissions from wood-burning devices can vary and depend on a variety of factors, including the design and age of the wood-burning device, the type and amount of fuel used, and the ability of the user to operate the device in accordance with manufacturer’s specifications and guidelines. Rule 6-3 defines wood-burning devices as any fireplace; wood heater, such as a wood or pellet stove; fireplace insert; or any permanently installed indoor device that burns solid fuel for space-heating or aesthetic purposes. In the process of burning wood or a solid-fuel product such as manufactured logs, pressed logs, or wood pellets, these devices must vent gases and combustion by-products through a flue or chimney. Devices that are sold in the Bay Area are required to be EPA certified to meet lower emission rates as certified by an accredited laboratory. There are a variety of wood-burning devices that either exist in homes or are available for purchase by the consumer. Table 1 breaks down wood-burning devices and their functions.

Table 1. Types of Wood-burning Devices and Their Function

<b>Burning Wood for Heat (Wood Heaters)</b>	
Wood Stove	<p>A wood stove is an appliance that is usually made of cast iron, steel, or stone. Wood stoves that burn wood for fuel can be used as a primary or secondary source of heat. There are generally two types of wood stoves: catalytic and non-catalytic stoves.</p> <p>In catalytic stoves, the smoky exhaust is passed through a coated ceramic honeycomb inside the stove where the smoke gases and particles ignite and burn. These types of stoves require maintenance and eventually the catalyst must be replaced during the lifetime of the stove, in order to meet stated emission limits.</p> <p>Non-catalytic stoves do not use a catalyst. Newer EPA certified stoves have three internal characteristics that create a good environment for more complete combustion and, therefore, reduced emissions. The three characteristics include firebox insulation; a large baffle to produce a longer, hotter gas flow path; and pre-heated combustion air introduced through small holes above the fuel in the firebox. These stoves still require</p>

	maintenance to operate effectively, but do not have a catalyst to replace.
Pellet Stove	Pellet stoves are similar in appearance to wood stoves; however, instead of wood, pellet stoves burn a renewable fuel made of ground, dried wood and other biomass wastes compressed into pellets that must meet specific characteristics, such as moisture content. Pellet stoves operate by pellets being poured into a hopper, which feeds automatically into the stove. Pellet stoves utilize active air and fuel management systems to control combustion efficiency. Unlike wood stoves and fireplaces, most pellet stoves need electricity to operate.
Fireplace Inserts	Fireplace inserts are similar in function and performance to free-standing wood or pellet stoves, but are designed to be installed within the firebox of an existing masonry or metal fireplace. These inserts may burn wood or pellets.
<b>Burning Wood for Ambiance</b>	
Fireplace	There are two major types of wood-burning fireplaces: traditional masonry fireplaces that are typically built of brick or stone and are constructed on site by a mason; and “low-mass” fireplaces that are engineered and pre-fabricated in a manufacturing facility prior to installation. In the Bay Area most fireplaces, whether masonry or low-mass, are not used as a primary source of heat; their primary function is for ambiance and heating is a secondary function.

## D. EPA Certified Wood Heater Requirements

### 1. Emission Requirements

Residential wood-burning devices contribute significantly to national particulate air pollution and the EPA has regulated wood heater particulate emissions since 1988. The EPA developed certification, associated testing and other requirements in order for wood heaters to obtain certification in Title 40, Code of Federal Regulations, Part 60, Subpart AAA (Standards of Performance for New Residential Wood Heaters). Wood heaters meeting certification requirements with an emissions rating of 4.1 grams per hour (g/hr) for units equipped with a catalytic combustor and 7.5 g/hr for units without a catalytic combustor were designated as “EPA Phase II Certified.” Rule 6-3 currently allows only wood heaters that are EPA Phase II Certified to be sold in the Bay Area.

On February 3, 2015, the EPA updated the emission standards for residential wood heaters establishing federal air standards for several types of previously unregulated new wood heaters. The updated requirements lower allowable emission rates for certified wood heaters and set emission rates for a broader range of previously unregulated wood- or pellet-burning heaters, stoves, and other residential heaters. These requirements also included setting performance standards for outdoor and indoor wood-fired boilers (also known as hydronic heaters), indoor wood-fired forced air furnaces, and single burn-rate woodstoves. Only wood- and pellet-burning stoves



or inserts are covered in this Air District staff report, because other heaters are not widely used in California and the greater Bay Area.

The EPA's updated requirements in Title 40, Code of Federal Regulations, Part 60, Subpart AAA, phase in the new emission requirements over a five-year period beginning in 2015. The requirements apply only to new wood heaters (manufactured and sold), and will not affect wood heaters already in use (see Section V, "Proposed Rule Amendments," in this staff report for the new emission requirements for the manufacturing and sale of residential heaters). A summary and report of the new emission standards can be found on EPA's website:

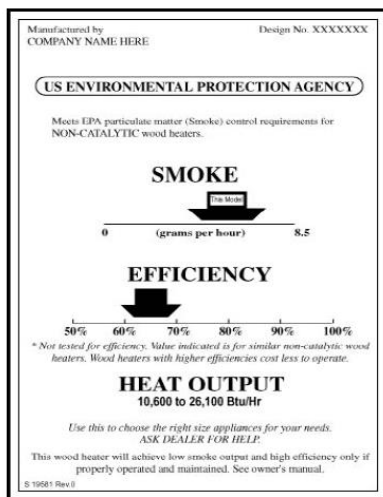
<http://www2.epa.gov/residential-wood-heaters/final-new-source-performance-standards-residential-wood-heaters>.

## 2. Labeling Requirements

The EPA's certification process requires manufacturers to verify that each of their wood heater model lines meets a specific particulate emission rate by undergoing emission testing at an EPA accredited laboratory.

An EPA-certified wood stove can be identified by a temporary paper label attached to the front of the wood stove and a permanent metal label affixed to the back or side of the wood stove. Certification labels verify and document that a wood heater has met standardized testing by an independent body and is designed so that the fine particulate emissions are less than the emission limits for the specific device type. Figure 1 is an example of an EPA certification label on a wood-burning stove.

Figure 1. Example of EPA Certification Label



*Temporary Wood Stove Label*



*Permanent Wood Stove Label*

### **III. PM<sub>2.5</sub> EMISSIONS FROM WOOD SMOKE**

Since Rule 6-3 was adopted, it is estimated that PM<sub>2.5</sub> emissions from residential wood-burning have been reduced by up to 59%. While the rule has been successful at reducing regional fine particulate matter levels, wood smoke continues to cause unhealthy air and PM<sub>2.5</sub> exceedances of the federal health standard. Additional health protective measures and PM<sub>2.5</sub> emission reductions are necessary to address both regional and local wood smoke concerns.

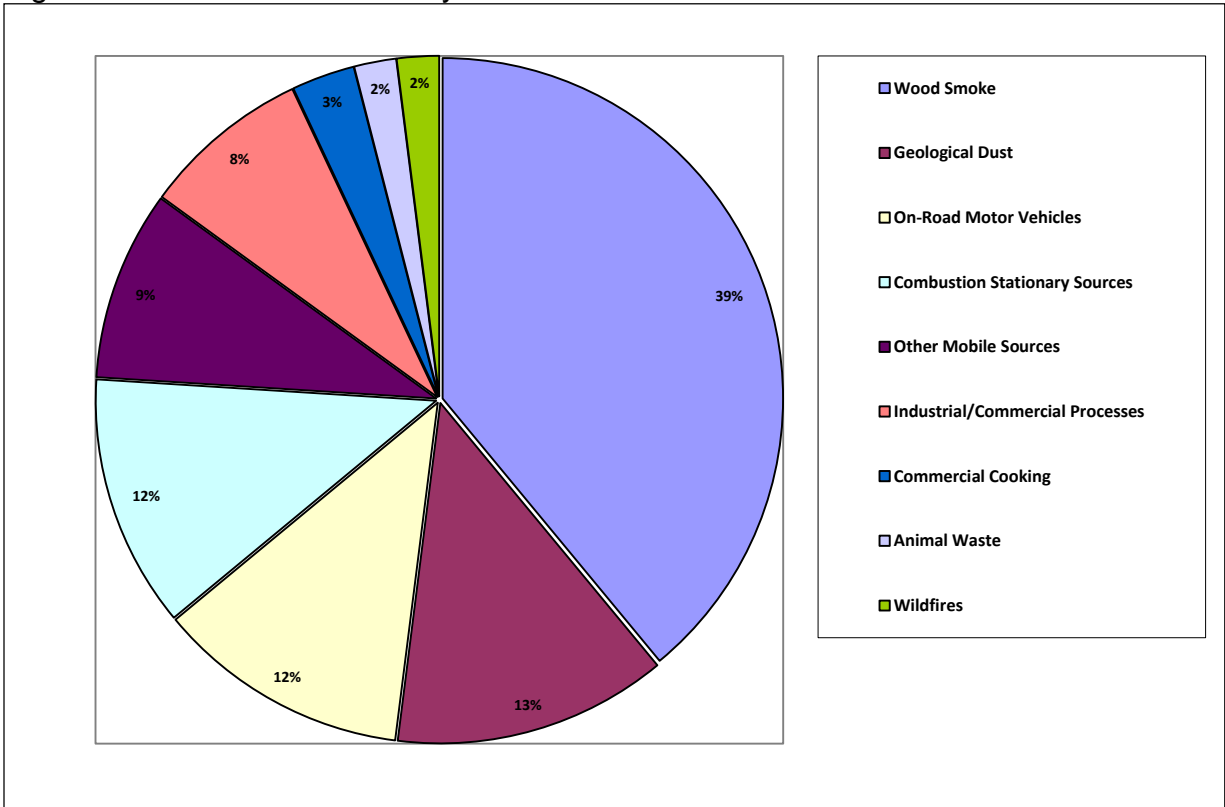
The Air District compiles regional and county level emissions inventories that detail emission estimates for air pollution sources associated with burning wood. Past, present, and future-year emissions inventories identify and quantify air pollution from wood-burning devices, which helps the Air District develop plans and rules to achieve and maintain air quality standards.

Each year, the Air District estimates the amount of fine particulate emissions from burning wood by combining multiple years of data from telephone surveys of Bay Area residents and demographic information from the U.S. Census Bureau. This allows the Air District to estimate the number of wood-burning devices and the amount of wood burned per year. An emission factor based on EPA's Compilation of Air Pollutant Emission Factors (AP-42) is then used to estimate the amount of particulates generated by wood burning from each county in the Bay Area.

#### **A. Winter Sources of PM<sub>2.5</sub> Emissions**

Wood-burning devices contribute substantial amounts of fine particulate matter into the atmosphere in the Bay Area especially during the winter months when wood burning is at its highest. Analysis of ambient particulate monitoring utilizing chemical mass balance modeling techniques, Carbon-14 dating of collected particulate matter, combined with Bay Area winter 2013 emission data, indicates wood smoke is the single greatest contributor (~30–40%) to PM<sub>2.5</sub> in the Bay Area. A breakdown of sources contributing to PM<sub>2.5</sub> concentrations is shown in Figure 2.

Figure 2. Winter Sources of Bay Area Fine Particle Pollution



### B. Emissions from Wood Burning Devices by County

Prior to the adoption of Rule 6-3, the Air District’s emission inventory in 2005 showed wood-burning devices contributed 17.61 tons per day (tpd) or 6,427 tons per year (tpy) of PM<sub>2.5</sub>. Based on 2014 emissions data shown below, it is notable that there was a sizable reduction in PM<sub>2.5</sub> emissions associated with wood smoke in the Bay Area regionally. This data shows the Air District achieved a 59% (2,660 tpy) reduction in PM<sub>2.5</sub> emissions from wood-burning devices.

Although the Bay Area region has benefited from reduced PM<sub>2.5</sub> emissions, wood smoke affects various parts of the Bay Area differently. Studies conducted by the Air District in Santa Rosa and the San Geronimo Valley concluded that wood smoke has significant localized impacts that result in exceedances of the PM<sub>2.5</sub> federal health standard.<sup>3</sup> In some cases wood smoke can contribute up to 70% of the PM concentration in a given area.<sup>4</sup> Therefore, even though emissions are going down regionally, certain neighborhoods, communities, cities, and counties can experience greater PM<sub>2.5</sub> concentrations than others.

Table 2 compares the 2005 and 2014 PM<sub>2.5</sub> emissions inventory for each of the nine counties in the Bay Area air basin.

Table 2. PM<sub>2.5</sub> Emissions by County 2005 and 2014

County	2005	2014
Alameda	2.22	1.37
Contra Costa	4.88	2.96
Marin	1.35	0.69
Napa	0.71	0.40
San Francisco	0.30	0.18
San Mateo	1.03	0.58
Santa Clara	3.61	2.18
Solano (Part within Air District)	0.90	0.50
Sonoma (Part within Air District)	2.59	1.46
<b>Total Emissions Bay Area</b>	<b>17.61 tpd (6427 tpy)</b>	<b>10.32 tpd (3767 tpy)</b>

\*Includes EPA-certified and non-EPA-certified devices

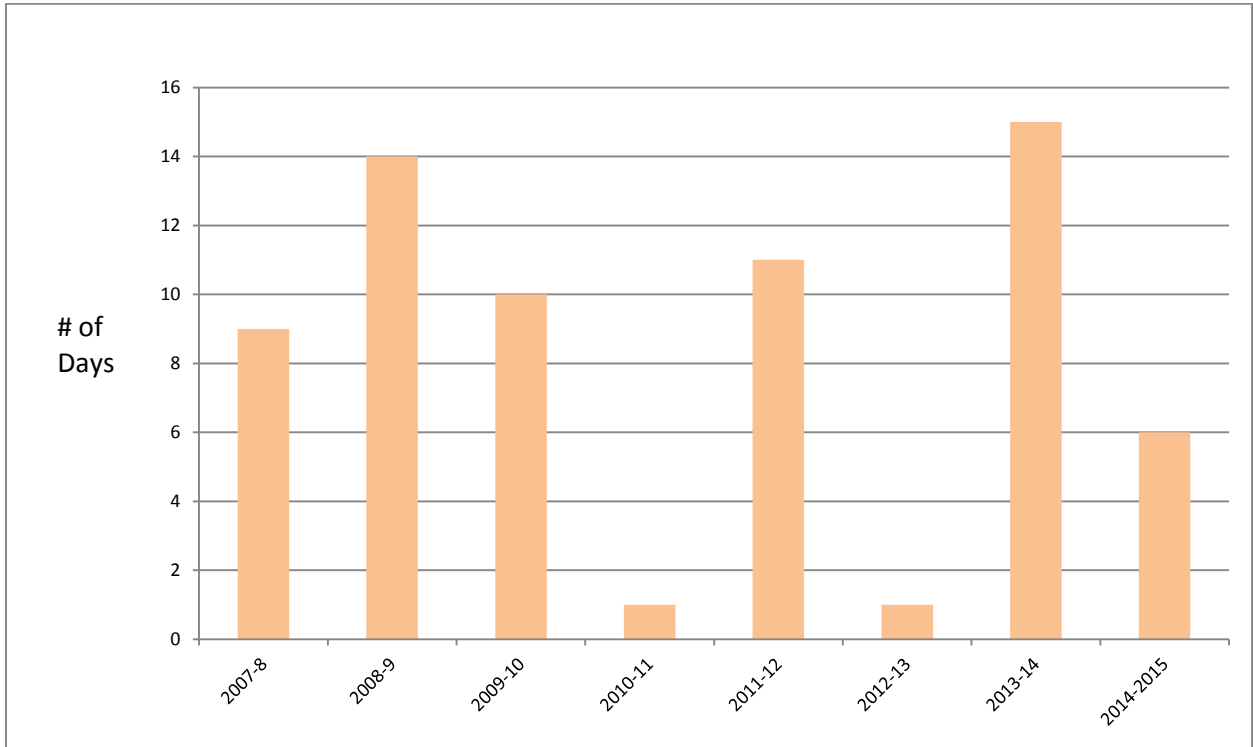
### C. Regional PM<sub>2.5</sub> Exceedances

To protect public health and welfare, the EPA adopted National Ambient Air Quality Standards for PM<sub>2.5</sub>. Rule 6-3 is a measure designed to help the Bay Area meet the NAAQS for PM<sub>2.5</sub> by forecasting an exceedance of the 24-hour PM<sub>2.5</sub> federal health standard of 35 µg/m<sup>3</sup>, triggering a *Winter Spare the Air Alert* and making it illegal to combust wood or any solid fuel in a wood-burning device.

PM<sub>2.5</sub> concentrations are monitored in the Bay Area by the Air District's comprehensive air monitoring network. The PM<sub>2.5</sub> measurements are used to determine compliance with the federal health standard, identify air quality trends and help Air District meteorologists forecast regional and local air quality.

During the past 8 winters, the Bay Area exceeded the 24-hour PM<sub>2.5</sub> NAAQS an average of 8 days, in comparison to an average of 17 days prior to Rule 6-3 adoption. Table 3 shows the number of exceedances each year since the adoption of Rule 6-3.

Table 3. Number of Federal PM<sub>2.5</sub> NAAQS Exceedance 2007 to 2014



Although the region is a non-attainment area for the 24-hour PM<sub>2.5</sub> standard, air quality in the Bay Area has improved over time and is moving closer to meeting the EPA’s 24-hour standard.<sup>5</sup> The Bay Area exceeds the 24-hour PM<sub>2.5</sub> standard less frequently than in the past, and when exceedances of the standard do occur, they are generally less severe. The combination of fewer days exceeding the standard and lower peak values on those days means that exposure of Bay Area residents to unhealthy levels of PM is reduced.<sup>6</sup> While the region’s wood smoke emissions are improving, reductions are still necessary to achieve clean air at both the local and regional levels and prevent future PM<sub>2.5</sub> exceedances of the 24-hour standard from occurring. The Bay Area meets both the State of California and the national annual PM<sub>2.5</sub> standards.

#### IV. PUBLIC EDUCATION, OUTREACH, AND INCENTIVES

The Air District takes a multifaceted approach to reducing emissions from residential wood-burning. Equally important to regulatory controls are the public outreach and education efforts that help everyone have a better understanding of the hazards of PM<sub>2.5</sub> that result in behavioral changes to reduce wood burning. In addition, incentive programs that provide help and financial assistance to transition older, more polluting heaters to cleaner technologies have also been put in place.

##### A. Winter Spare the Air Program

The Air District’s Winter Spare the Air (WSTA) Program notifies residents when particulate matter levels are forecast to be unhealthy and prohibits wood-burning

throughout the Bay Area. The program communicates through a range of Bay Area networks and media outlets throughout the winter season. When a *Winter Spare the Air Alert* is declared, burning wood, firelogs, pellets, or any other solid fuels in fireplaces, woodstoves, or other wood-burning devices is illegal. Residents and businesses can call 1-877-4NO-BURN (1-877-466-2876) to check the *Winter Spare the Air Alert* status. Residents can sign up to receive automatic phone *Winter Spare the Air* alerts by calling 1-800-430-1515.

## **B. Incentive Program**

In addition to amending Rule 6-3, the Air District is developing a financial incentives program to help replace uncertified wood-burning devices with cleaner, more efficient heating devices to further decrease fine particulate emissions due to wood burning. By providing financial assistance to households, this program is designed to encourage eligible Bay Area residents to upgrade their more polluting wood-burning devices, such as fireplaces and uncertified wood stoves, to cleaner heating devices. This program will have the flexibility to focus on neighborhoods that experience unhealthy air quality as a result of wood smoke, as well as provide assistance to low-income households. The Air District plans to implement this incentive program in tandem with proposed Rule 6-3 rule amendments.

## **V. PROPOSED RULE AMENDMENTS**

Since the adoption of Rule 6-3 in 2008, the Air District has recognized there are parts of the Rule that can benefit from changes or additional clarification to ensure interpretation and enforcement are consistent with the intent of the rule to further reduce PM<sub>2.5</sub> emissions regionally and locally. In March and April 2015, the Air District hosted nine public workshops to discuss proposed amendments to the rule.

This section summarizes the Air District's revised proposal following nine workshops at which the public provided input and ideas on the rule. The proposed amendments incorporate changes from public comments received during workshop as well as comments from interested parties and stakeholders. The Air District is proposing the following amendments to Regulation 6, Rule 3.

### **A. Sole Source of Heat Exemption**

In Rule 6-3, a wood-burning device may be used during a *Winter Spare the Air Alert* if that wood-burning device is the only source of permanently installed heat. Following rule adoption in 2008, and through its policy, the Air District clarified that a dwelling with a permanently installed propane heater does not qualify for this exemption.

The Air District proposes to amend the Sole Source of Heat exemption to strengthen and clarify the conditions for qualification. The proposed amendment would require that residences using a non-certified wood-burning device or fireplace as their only source of heat replace or upgrade it to an EPA certified device to qualify for this exemption. Additionally, a claimant would be required to register that EPA-certified device with the

Air District to receive this exemption. The Air District's new proposed registration program requirement is discussed later in this section.

This proposal ensures that devices used as sole sources of heat are cleaner and more efficient than those previously exempt from the rule. Wood stoves tend to last a long time and are replaced less frequently than other major appliances; so many older, uncertified wood-burning devices are still used regularly for heating. For this reason, the replacement of older, more polluting, uncertified wood burning devices that are used as primary heating in areas without natural gas is vital to improving air quality.

### **B. Exemption for Non-functional, Permanently Installed Heaters**

Rule 6-3 currently does not provide an exemption for non-functional heaters and does not address concerns where a wood-burning device may be the only source of heat available until the primary heater is repaired. The Air District proposes a temporary 30-day exemption to allow use of a wood-burning device during a *Winter Spare the Air Alert* while a repair is being made to resume function of a non-wood heater. This exemption will only apply if a household has no alternate form of heat available, such as gas or electric heating. The proposal would require claimants to submit repair documentation for verification upon request by the Air District within ten days.

### **C. Exemption for Loss of Natural Gas and/or Electric Power**

The current Rule 6-3 has two separate exemptions for temporary gas or electric service outages. These exemptions allow use of a wood-burning device during a *Winter Spare the Air Alert* if there is a loss of natural gas and/or electric power due to natural disasters, such as, but not limited to, earthquakes, fires, floods, storms, or if an outage is due to utility service disruptions. The Air District is proposing to combine these two exemptions sections into one and require that service outages must be verifiable by the local utility service provider.

### **D. Clarify, Amend, or Add Definitions to Rule**

The proposed changes to definitions in Section 200 of the rule would include a number of new or amended definitions to support amended rule requirements. Please see the proposed draft Rule 6-3 for the full list of proposed definitions.

### **E. U.S. EPA Requirement for Residential Wood Heaters**

Since adoption of Rule 6-3 in 2008, the Air District has enforced EPA requirements for residential wood heaters such that all wood heaters sold in the Air District must be "EPA Phase II Certified" in accordance with Title 40, Code of Federal Regulations, Part 60, Subpart AAA.

On February 3, 2015, EPA updated emission standards for new residential wood heaters and the Air District is proposing to require wood burning devices to meet these new certification requirements. EPA's new emission standards and five-year

compliance schedule for new heaters establishes health-protective measures that ensure manufacturers continue to move toward cleaner technologies and consumers transition to cleaner heater options. The Air District fully supports this transition and encourages all consumers with older wood stoves that were purchased before 1988, and are not EPA certified, to take advantage of these new cleaner, EPA-certified heating options.

Newly manufactured wood heaters have to comply with the emissions standards and specified test methods in Title 40, Code of Federal Regulations, Part 60, Subpart AAA, as summarized in Table 3.

Table 3. Title 40, CFR Part 60, Subpart AAA: Requirements for Wood Heater Manufacturers and Retailers

Requirement	Emissions Rating	Compliance Date
40 C.F.R. 60.532(a)	4.5 g/hr	May 15, 2015
40 C.F.R. 60.532(b) and (c)	2.5 g/hr (crib tested) 2.0 g/hr (cordwood tested)	May 15, 2020
40 C.F.R. 60.532(a)	Effective December 1, 2015, devices that have an emission rating of greater than 4.5 g/hr can no longer be sold, purchased, or installed.	

Wood heaters currently in use and in homes are not affected by these new emission standards and the standards do not require a replacement or upgrade of existing devices. They also do not apply to outdoor fireplaces, pizza ovens, fire pits, barbecues, or chimineas.

For a list of all EPA-certified wood heaters, please refer to:  
<http://www2.epa.gov/sites/production/files/2013-08/documents/certifiedwood.pdf>

#### **F. Requirement for Sale, Resale, Transfer or Installation of Wood-Burning Devices**

The current rule prevents the sale, resale, supply, transfer, or installation of non-EPA certified wood-burning devices within the Bay Area. The purpose of this requirement is to ensure that no member of the general public sells or purchases wood-burning devices that are not EPA certified. This provision is intended to remove loopholes that allow non-compliant stoves to stay on the market and be sold by the general public. This requirement applies to both used and new devices; however, the requirement does not apply to a wood-burning device that is an existing installed fixture included in the sale or transfer of real property.

#### **G. Visible Emissions Limitation**

The visible emissions limitation in the current Rule 6-3 uses the Ringelmann Smoke Chart to measure the apparent density of smoke. The Ringelmann No. 1 limit used in Rule 6-3 is a visible emission standard equivalent to 20% opacity. Visible emissions



may not exceed 20% opacity from chimneys, stovepipes, or flues based on visual observation for at least six consecutive minutes in any one-hour period. This requirement does not apply to the startup of a new fire for 20 minutes in any four-hour period.

The Air District proposes to amend and strengthen the standard to be consistent with Regulation 6, Rule 1, General Requirements, for sources of particulate matter. The proposed amendment would not change the 20% opacity limit; however, it would shorten the duration of excessive visible emissions to three minutes in any hour. Following a 20-minute start-up allowance for new fires, visible emissions of greater than 20% opacity and aggregate to three minutes in any hour would be prohibited. This requirement does not apply to the startup of a new fire for 20 minutes in any four-hour period. The proposed amendment would make it easier for Air District staff to determine which wood-burning devices are not operating properly and creating excessive smoke.

## **H. Real Estate and Rental Disclosure Requirement**

The purpose of Rule 6-3 is to limit emissions of particulate matter and visible emissions from wood-burning devices to protect air quality and public health. It is vital that the public understands the health hazards of PM<sub>2.5</sub> and why choosing clean heating alternatives that do not burn wood is important.

The Air District is proposing a proactive and informative measure that would require disclosure when selling, leasing, or renting properties with wood-burning equipment. The disclosure must describe the negative health impacts of PM<sub>2.5</sub>. The requirement for disclosure of the negative health impacts of PM<sub>2.5</sub> exposure is consistent with the Air District's mission to educate the public, discourage wood-burning, and encourage the transition to cleaner heating alternatives. Guidance from the Air District to develop language in the disclosure documents would be provided to real estate and rental associations.

## **I. Requirement for Rental Properties**

The Air District is proposing a new requirement that all rental properties in areas with natural gas availability include a permanently installed form of heat that does not burn wood or solid fuel. This supports existing requirements in the California Health and Safety Code, Division 13, Part 1.5, *Regulation of Buildings Used for Human Habitation*, which requires landlords to provide adequate heat to tenants. This proposed requirement further ensures all landlords provide tenants with a cleaner heating option than burning wood in areas that have natural gas by disallowing all rental properties in areas with natural gas service from claiming the Sole Source of Heat exemption.

## **J. Requirement for New Building Construction**

Rule 6-3 currently allows any new construction of a building or structure to install a wood-burning device that meets EPA certification requirements.

The Air District proposes to amend and strengthen this requirement by ensuring new construction in the Bay Area transition to only the cleanest, most efficient heating options, such as, but not limited to, gas-fueled or electric heaters. Under this proposed amendment, new buildings could no longer install a wood-burning fireplace or EPA-certified wood heater.

### **K. Requirement for Fireplace or Chimney Remodels**

Rule 6-3 currently requires the installation of a gas-fueled, electric, or EPA-certified wood-burning device as part of a remodel of a fireplace or chimney, when that remodel construction requires a local building permit. The current requirement of the rule is vague and may unreasonably require any fireplace or chimney remodel, regardless of the scale or scope of the remodel job, to install an EPA-certified device.

The Air District proposes to amend and clarify this requirement so that only remodels with costs greater than \$15,000 (excluding cost of local building permit) and that require a building permit would trigger the installation of an EPA-certified, gas-fueled, or electric device. Enforcement of this provision would be by the local city or county where the building permit is received.

### **L. Registration Requirement**

The Air District proposes to establish a new registration program that would require all claimants of Sole Source of Heat exemption to register their EPA certified wood-burning devices. The Air District is proposing a free registration program with a requirement to renew the registration every five years. Registrants would be required to maintain all documents that verify Sole Source of Heat exemption status and would be required to be able to demonstrate that registered devices are operated according to manufacture specifications.

This proposed registration requirement would provide an inventory of EPA-certified wood-burning devices in geographical areas without natural gas service and allow the Air District to strategically allocate resources to households that are not using EPA-certified devices in areas without natural gas service. This proposed requirement also would allow Air District staff to better address wood smoke concerns in certain communities that do have natural gas service and are using wood-burning devices during WSTA alerts.

### **M. Mandatory Burn Ban**

Rule 6-3 prohibits wood-burning in the Bay Area when forecasts indicate PM<sub>2.5</sub> concentrations will reach unhealthy levels, exceeding the 24-hour PM<sub>2.5</sub> federal health standard of 35 µg/m<sup>3</sup> resulting in a WSTA. This requirement is currently named in the rule as “Solid-fuel Burning Curtailment.”

The Air District does not plan to amend the standard of this requirement; however, the Air District is proposing to amend the name by changing it from “Solid-fuel Burning

Curtailement” to “Mandatory Burn Ban.” A name change would effectively communicate to the general public that when a WSTA alert is declared, a “Mandatory Burn Ban” is in effect and wood burning is illegal in the Bay Area.

## VI. EMISSION REDUCTIONS

In 2008, the Air District estimated PM<sub>2.5</sub> emissions would be reduced by 983 tpy due to the implementation of Rule 6-3, based on data from the 2005 emissions inventory. A comparison of emissions in 2005 with the Bay Area’s 2014 emissions inventory highlights the rule’s effectiveness in reducing PM<sub>2.5</sub> emissions on a regional level. Since the adoption of Rule 6-3 in 2008, the Air District estimates emissions have been reduced by 59% (2,660 tons per year).

The Air District estimates an additional PM<sub>2.5</sub> emissions reduction of 321 tpy from the 2015 proposed amendments. Table 4 summarizes the estimated reductions expected from each proposed amendment.

Table 4. Projected Emissions Reduction from Rule 6-3 Amendments

2015 Proposed Amendments	Estimated PM <sub>2.5</sub> Reductions
Sole Source of Heat Exemption (EPA certified only)	260 tpy
Requirement for Rental Properties	17 tpy
Requirement for New Building Construction	44 tpy
<b>Total Emissions Reduced</b>	<b>321 tpy</b>

The section below discusses the emission reductions from each of the Air District’s 2015 proposed requirements.

### A. Sole Source of Heat Exemption

This proposed exemption requires replacement of an uncertified wood-burning device with an EPA-certified wood-burning device in order to claim Sole Source of Heat exemption. An additional component to this requirement is that the EPA-certified wood heater must be registered with the Air District’s Registration program. Table 6 describes typical heating requirements for an average household and compares the estimated cost and associated emissions from an uncertified device with an EPA-certified device.

Table 6. Cost Comparison of EPA-Certified Heater vs. Non-Certified Device

	<b>NON-CERTIFIED WOOD-BURNING DEVICES</b>  (DOES NOT QUALIFY FOR PROPOSED EXEMPTION)		<b>EPA-CERTIFIED WOOD HEATERS</b>  (QUALIFIES FOR PROPOSED EXEMPTION)	
<b>Type of Heater</b>	Fireplace	Uncertified Wood Stoves/Inserts	EPA-Certified Wood Stove/Insert	Pellet Stove/Insert
<b>Fuel Cost</b>	\$400/cord	\$400/cord	\$400/cord	\$250/ton
<b>Heat Efficiency</b>	10%	50%	70%	78%
<b>Cost of Heating (per MM BTU)</b>	Hard Woods: \$162.62	Hard Woods: \$32.52	Hard Woods: \$23.24	\$19.43
	Soft Woods: \$253.16	Soft Woods \$50.64	Soft Woods: \$36.16	
<b>PM<sub>2.5</sub> Emissions</b>	300 lbs	*60 lbs	7 lbs	5 lbs

\*Requires only 0.2 cords of wood needed for equivalent heat output

The proposed amendment is expected to reduce emissions specifically in geographical areas where there is no natural gas service. Based on census data from 2009 to 2013, the Air District estimates that approximately 19,000 households used wood as a primary source of heat. Of those households, it is estimated that 50% of homes in areas without natural gas use an EPA-certified wood-burning device for heating and the other 50% use an uncertified wood-burning device, such as a wood stove or fireplace. The Air District estimates PM<sub>2.5</sub> emissions would be reduced by 260 tons per year resulting from this proposed exemption amendment. Table 7 shows the estimated PM<sub>2.5</sub> emission reductions associated with the replacement of uncertified wood-burning devices with EPA-certified wood heaters.

Table 7. Emissions Reduction from Proposed Exemption Amendment

# of Households	Annual PM <sub>2.5</sub> Emissions for the Device	Total Annual PM <sub>2.5</sub> Emissions
50% of households w/EPA-certified wood heaters	7 lbs	30 tpy
50% of households with uncertified wood-burning devices	60 lbs	290 tpy
<b>Estimated Total Emissions Reduced</b>		<b>260 tpy</b>

## B. Requirement for Rental Properties

The Air District is proposing this amendment to ensure all rental properties located in natural gas service areas have a permanently installed source of heating that does not burn wood. Through the review of 2009–2013 census data, the Air District estimates approximately 5,000 rental units in the Bay Area use a wood-burning device as their

primary source of heating. The census data does not provide details on whether these rental properties are in areas with or without natural gas service.

To estimate emission reductions, the Air District assumes that 4,700 of these 5,000 rental properties are in areas without natural gas service and are subject to the Sole Source of Heat exemption. The Air District estimates 300 rental properties are located in areas that have natural gas service but landlords do not provide a gas heater, forcing tenants to use a wood-burning device as a primary source of heat. Of the 300 rental properties, one-third of those are assumed to have fireplaces and two-thirds of those are assumed to have uncertified wood stoves. If 300 rental properties that previously only had a wood-burning device as the primary source of heat install a permanent gas-fueled heater, it is estimated that PM<sub>2.5</sub> emissions would be reduced by 17 tpy. Table 8 describes the assumptions and estimated emissions reduction from the proposed amendment.

Table 8. Emissions from Rental Property Retrofits in Areas Served by Natural Gas

# of Devices	Annual PM <sub>2.5</sub> Emissions for the Device	Total Annual PM <sub>2.5</sub> Emissions
Fireplaces (83)	300 lbs	12 tpy
Uncertified Wood Stoves (167)	60 lbs	5 tpy
<b>Estimated Total Emissions Reduced</b>		<b>17 tpy</b>

The Air District anticipates this proposed amendment will have minimal impact for most rental units because a majority of the single-family homes and multi-unit dwellings offered for rent do not rely on wood-burning devices as a primary and sole source of heat. This requirement is proposed to become effective November 1, 2018, which would allow landlords time to prepare and to provide a second form of heat to tenants.

### C. Requirement for New Building Construction

In 2008, the Air District projected 58 tpy of emissions reduction from the requirement that new construction install EPA-certified wood-burning devices. The Air District is currently proposing to strengthen the requirement by prohibiting the installation of any wood-burning device in new building construction, including prohibition of EPA-certified devices. This requirement would continue the downward trend in homes using wood-burning devices that contribute to PM<sub>2.5</sub> emissions. The Air District estimates the proposed requirement would further reduce emissions by 44 tpy. The estimate is based on survey results that indicate the types of fuel Bay Area households burn and the frequency with which the households burn those fuels. These trends were applied to Association of Bay Area Governments (ABAG) future household projections to estimate the emissions reduction.

### D. Ancillary Emission Reductions

#### 1. Strengthen Visible Emissions Limitation

The Air District is unable to calculate the emissions reduction associated with this proposed amendment because of the lack of sufficient data. There are not consistent quantitative correlations between opacity and the mass of particulate matter emitted. This lack of correlation is largely due to the various flow rates from chimneys and stove pipes, combined with changing or variable particulate size and composition. A Ringelmann No. 1 standard (20% opacity), however, is consistent with visible emission standards applied to industrial sources and indicates whether solid fuel combustion is efficient. Air District staff anticipates the cumulative effects of this requirement will contribute to lower local and regional particulate matter concentrations.

## 2. Requirements for Disclosure Documents

The primary reason for proposing the requirement for sale and rental property disclosure documents is to inform the public of the significant health impacts of burning wood and the health hazards of PM<sub>2.5</sub>. The Air District anticipates there will be some emissions reduced from this proposed requirement; however, because it is dependent on personal choice whether to replace a wood-burning device with a cleaner heating option, it is not possible to quantify the emission reductions from this proposed requirement.

## 3. Requirements for Wood Heater Manufacturers and Retailers

U.S. EPA's new updated emission requirements for Title 40, Code of Federal Regulations Part 60, Subpart AAA, require manufacturers and retailers of residential heaters to meet specific emissions rates. For emission reductions associated with the new requirements, please refer to U.S. EPA's website:

<http://www2.epa.gov/residential-wood-heaters/final-new-source-performance-standards-residential-wood-heaters>

# **VII. ECONOMIC IMPACTS**

This section discusses the estimated costs and economic impacts associated with the proposed rule amendments.

## **A. Sole Source of Heat Exemption and Registration**

The proposed amendment to the Sole Source of Heat exemption requires replacement of existing uncertified wood-burning devices with EPA-certified wood heaters and requires registration of those devices with the Air District. This section discusses other heating options that are available; however, for the purposes of this rule, the economic impact is analyzed for the replacement to an EPA-certified wood heater.

### 1. Heating Options and Cost Estimates

Table 9 provides a comparison of the range of heaters that are available and the estimated costs for the different heating options. This table does not include associated cost of installation or building permit fees.

Table 9. Comparison of Heating Options and Estimated Costs

	EPA-CERTIFIED WOOD HEATERS		GAS-FUELED HEATERS		ELECTRIC HEATERS	
Type of Heater	Wood Stove/Insert	Pellet Stove/Insert	*Natural Gas Stove/Insert	Propane Heater	Electric Resistance Heat	Electric Heat Pump
Fuel Cost	\$400/cord	\$250/ton	\$12/MCF	\$2.50/gal	\$0.18/kWh	\$0.18/kWh
Heat Efficiency	70%	78%	78%	78%	100%	300%
Cost of Heating (per MM BTU)	Hard Woods: \$23.24	\$19.43	\$15.38	\$34.34	\$52.79	\$19.16
	Soft Woods: \$36.16					
Cost of Device	\$2,500–\$6,000	\$2,500–\$6,000	\$2,500–\$6,000	\$2,500–\$6,000	\$500–\$2,000	\$5,000–\$10,000+

\*Heating device not applicable in areas without natural gas service.

Although this proposed change requires the replacement to an EPA-certified device and registration in order to qualify for the Sole Source of Heat exemption, the Air District encourages those seeking to replace an existing wood-burning device to also consider other cleaner heating options, such as gas-fueled (i.e., propane heating), or electric heating (i.e., electric heat pumps or other electric heating appliances), because there is not a large degree of cost difference between the various heating devices.

## 2. Heating Efficiencies and Estimated Emission Reductions

It is important to understand the differences in heating efficiencies for the different heating options available, because it can greatly influence overall cost. Residences replacing a fireplace with an EPA-certified heater, which is approximately 60% more efficient than a fireplace, will see significant fuel cost savings. The heat benefits can be further increased by burning harder woods. A higher heating efficiency and more efficient fire leads to more complete combustion, lower emissions, and lower fuel costs. Significant heat benefits also can be achieved by replacing an uncertified wood stove/insert with an EPA-certified wood stove and/or pellet stove; however, those benefits will be less than those of a fireplace versus EPA-certified stove replacement.

Table 10 summarizes the estimated emissions reduction and heating efficiencies when replacing an uncertified wood-burning device with a cleaner, more efficient EPA-certified wood heater.

Table 10. Emission Reduced from Replacement of an Uncertified Heater with an EPA Certified Device

<i><b>FROM</b></i>	<i><b>TO</b></i>	<i><b>Estimated Emissions Reduction</b></i>
Uncertified Wood Stove/Insert (50% efficient)	EPA Certified Wood Stove/Insert (70% efficient)	88.0%
	Pellet Stove/Insert (78% efficient)	90.0%
Fireplace (10% efficient)	EPA Certified Wood Stove/Insert (70% efficient)	97.6%
	Pellet Stove/Insert (78% efficient)	98.0%

The Air District estimates replacement of an existing uncertified wood stove with an EPA-certified heater will cost approximately \$2,500 to \$6,000 for the device. There is a wide variety of EPA-certified heaters and the cost is dependent on the type of heating device selected. Heaters also vary in cost depending on the size of the device, type of fuel, heating efficiencies, and personal style preference. The cost of installation also can vary greatly, because each residence is unique and costs associated with each installation depend on how much retrofitting is required. Typical costs include ducting and structural work. Additionally, local building permits that may be required also range in cost, depending on the city or county.

The Air District estimates that a relatively basic, EPA-certified heater costs \$5,000, including installation, and has the following approximate wood cost savings and cost effectiveness per ton of PM<sub>2.5</sub> emissions reduced:

- By replacing an uncertified wood stove/insert with an EPA-certified wood heater, it is estimated that annual wood cost savings would be \$100 from the 20% heat efficiency increase. Cost effectiveness of this replacement is estimated at \$35,000 per ton of PM<sub>2.5</sub> reduced. The Air District estimates that this proposed exemption amendment would be a cost effective measure to reduce PM<sub>2.5</sub> emissions.
- By replacing a fireplace with an EPA-certified wood heater, it is estimated that annual wood cost savings would be \$300 from the 60% increase in heat efficiency. Cost effectiveness of this replacement is estimated at \$23,000 per ton of PM<sub>2.5</sub> reduced. The Air District estimates that this proposed exemption amendment would be a cost effective measure to reduce PM<sub>2.5</sub> emissions.

Table 11 shows the costs and cost effectiveness of installing an EPA-certified heater based on fuel savings.



Table 11. Cost of Replacing an Uncertified Device with an EPA-Certified Heater

<b>FROM</b>	<b>TO</b>	<b>Wood Cost Savings and Estimated \$ / Ton of PM<sub>2.5</sub></b>
Uncertified Wood Stove/Insert (50% efficient)	EPA Certified Wood Stove (70% efficient)	\$100 wood savings \$35,000 / ton of PM <sub>2.5</sub>
Fireplace (10% efficient)	EPA Certified Wood Stove (70% efficient)	\$300 wood savings \$23,000 / ton of PM <sub>2.5</sub>

### 3. Registration of EPA Certified Wood Heater

The Air District anticipates the registration program to have no cost impacts on residents in the Bay Area as this registration is free and is only required if a an EPA-certified wood heater is used as the primary source of heat during a *Winter Spare the Air Alert*. Sole Source of Heat exemptions are allowed only if no permanently installed gas (i.e., natural gas or propane) or electric heating options are available.

This registration program is voluntary as a household may choose not to claim exemption and not use a wood-burning device during a *Winter Spare the Air Alert*. However, if a person is found to be using an unregistered device when wood-burning is prohibited, that person is in violation of the rule and subject to enforcement action.

A household who claims Sole Source of Heat exemption is required to renew the exemption within 5 years of initial registration.

### **B. Requirement for Rental Properties**

The proposed requirement is anticipated to have minimal economic impact because the Air District expects that a majority of rental units already have a natural gas heater in areas with natural gas. For rental properties in areas that have natural gas service, but only have a wood-burning device as a primary source of heat, the proposed amendment would require landlords to provide a permanently installed source of heat that does not burn wood. For the purposes of determining cost estimates, the Air District assumes a landlord will choose to install a natural gas heater over other available heater options because the rental property has natural gas service.

The replacement of an uncertified wood stove and installation of a 70% heat-efficient natural gas heater costing about \$5,000 (including installation) is estimated to have approximately \$400 in annual wood cost savings. For 21 tpy emissions reduction, the cost effectiveness is estimated at \$27,000 per ton of PM<sub>2.5</sub> reduced. The Air District determines this proposed amendment would be a cost effective measure to reduce PM<sub>2.5</sub> emissions.

Replacing a fireplace that is assumed to be used for heating a rental property and installing a 70% heat efficient, gas-fueled heater costing approximately \$5,000

(including installation) is estimated to result in approximately \$2,000 in annual wood cost savings. For 21 tpy emissions reduction, the cost effectiveness is estimated at \$5,600 per ton of PM<sub>2.5</sub> emissions reduced. Because the heat savings outweigh the cost of the natural gas device, this replacement is extremely cost effective, especially in cases where the new heating device is used exclusively and no wood is burned. The Air District determines this proposed amendment would be a cost effective measure to reduce PM<sub>2.5</sub> emissions; however it must be noted that the population of rental properties affected by this proposed requirement is likely extremely small.

The Air District estimates that the cost to a landlord would be the cost of the permanently installed gas-fueled or electric device, as described in Table 12.

Table 12. Cost of Replacing an Uncertified Device with a Natural Gas Heater

<i>FROM</i>	<i>TO</i>	<i>Wood Cost Savings and Estimated \$ / Ton of PM<sub>2.5</sub></i>
Uncertified Wood Stove/Insert (50% efficient)	Natural Gas Heater (70% efficient)	\$400 wood savings \$27,000 / ton of PM <sub>2.5</sub>
Fireplace (10% efficient)	Natural Gas Heater (70% efficient)	\$2,000 wood savings \$-5,600 / ton of PM <sub>2.5</sub>

### C. Requirement for New Building Construction

The proposed rule amendment would prohibit builders from installing wood-burning devices. New construction could only include installation of devices such as gas-fueled or electric heaters. The Air District anticipates this proposed amendment would have minimal economic impact because the majority of multi-unit construction projects do not install wood-burning devices in order to minimize fire concerns, and new construction can utilize other equivalent gas or electric heating options that are similar in cost. The Air District estimates that there would be no incremental cost associated with this proposed amendment.

### D. Air District Staffing Impacts

The success of Rule 6-3 demands increased staffing across multiple Air District Divisions. Compliance and Enforcement, Communications, Meteorology Measurements and Rules, Strategic Incentives, and Legal collectively work to help ensure the success of this rule. The implementation of this rule and the proposed amendments depend on Air District Meteorologists providing daily forecasts and on Inspectors to respond to complaints and conduct investigations during WSTA alerts. Violations are documented, processed, and reviewed by the Compliance and Enforcement Division, and violation notices or warning letters are reviewed by the Legal Division and penalties are determined. Another key component to the success of Rule 6-3 is the education and outreach efforts conducted by the Communications Division through the robust Winter Spare the Air Program. The Air District's progressive education and outreach help people understand the health impacts associated with

wood smoke and will continue to play a key role in encouraging participation during WSTA alerts and the transition to cleaner heating options. The Air District's Incentives Division will continue to help develop financial incentives to help households obtain cleaner and more efficient heating devices and network with other local agencies to provide similar programs and incentives to improve air quality locally. The following proposed rule amendments will likely demand additional Air District staffing resources within various levels of the District:

- The Fireplace and Chimney Remodel requirement would require staff to reach out to all local cities and counties in the Air District's jurisdiction to ensure enforcement of the proposed change to the rule.
- The proposed rule amendment to prohibit installation of wood-burning devices in new construction would require outreach to builders and local cities and counties to ensure compliance with the new requirement when issuing building permits.
- The requirement for disclosure documents during the sale and for rental properties would require staff to work with real estate, apartment, and rental associations in the nine Bay Area counties to develop language to communicate PM<sub>2.5</sub> hazards.
- The standardization of the Visible Emissions Limitation would likely make it easier for Inspectors to determine which households are not burning cleanly and are exceeding the visible emissions standard. It is expected that easier enforcement of this standard could increase the number of violations documented, which could affect staffing resources for processing and review.
- The registration requirement to claim Sole Source of Heat exemption would be expected to increase staff workloads; however the long-term benefits of the registration program are likely to save staff time and resources. Once households in areas without natural gas register EPA-certified wood-burning devices, the Air District could identify those non-registered or non-exempt households and focus resources to encourage those households to transition to cleaner heating devices. The Air District plans to use existing computer programs to compile registrations and does not expect additional computer hardware/software costs.

## **E. Incremental Costs**

Under California Health and Safety Code Section 40920.6, the Air District is required to perform an incremental cost analysis for a proposed rule under certain circumstances. To perform this analysis, the Air District must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the Air District must "calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option."

For the proposed regulation, staff has not identified any incremental costs since the regulation does not impose any one specific control technology. EPA certified devices are the industry standard for new wood-burning devices.

## 1. Point of Sale Requirement

During the public workshops, the Air District presented a point-of-sale concept that would help transition the Bay Area to cleaner and more efficient heating options. The proposed point-of-sale requirement would require all real estate sales and transfers to replace an uncertified wood-burning device with a gas-fueled device, electric device, or EPA-certified wood-burning device. During the rule development process, the Air District received an overwhelming number of comments concerning this proposed real estate requirement. Upon further consideration, the Air District decided to withdraw the proposed real estate requirement.

The Air District withdrew the proposed amendment because the financial burden of retrofitting a fireplace with a gas-fueled, electric, or EPA-certified wood-burning device was estimated to range in cost from \$3,000 to \$6,000, depending on the type of device selected by the homeowner. Emission reductions from converting a fireplace or wood stove to an EPA-certified device are cost effective for homes that burn wood regularly; however, if the homeowner seldom or never burns wood, there are no emission reductions and the cost to convert are not justified.

## **VIII. SOCIOECONOMIC IMPACTS**

Section 40728.5 of the California Health and Safety Code requires an air district to assess the socioeconomic impacts of the adoption, amendment or repeal of a rule if the rule is one that “will significantly affect air quality or emissions limitations.” Bay Area Economics, Berkley, California has prepared a socioeconomic analysis of the proposed amendments to Regulation 6, Rule 3. The analysis came to the following conclusions:

- Affected households, landlords and renters should be able to absorb the costs of compliance with the proposed rule amendments that require a replacement of existing uncertified wood-burning devices and a transition to cleaner heating options.
- There may be a significant economic impact to profit and revenue on small businesses selling firewood due to the estimated reduction in wood burning by 20% from the proposed rule amendments.

## **IX. ENVIRONMENTAL IMPACTS**

Pursuant to the California Environmental Quality Act, the Air District’s environmental consultant, Environmental Audit Inc., conducted a study to determine whether there are any potential significant adverse environmental impacts associated with the rule amendments. The study concludes that there are no significant impacts and a negative declaration is proposed for adoption by the Air District Board of Directors. The study and negative declaration will be circulated for public comment prior to consideration by the Board of Directors.

## **IX. REGULATORY IMPACTS**

Section 40727.2 of the Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and district air pollution control requirements for the equipment or source type affected by the proposed change in district rules. The district must then note any differences between these existing requirements and the requirements imposed by the proposed change. Adoption of these rule amendments do not conflict with any existing federal or Air District requirements.

## **XI. RULE AMENDMENT PROCESS**

This rule amendment process included extensive public outreach to ensure as many stakeholders as possible were involved in developing this proposal. Outreach has included the hearth product trade organizations and industry representatives, national and local health organizations, county health and building departments, and members of the public with an interest in wood burning. The outreach efforts also included a series of nine workshops for interested parties and the general public at the end of March and throughout the month of April 2015.

The purpose of the rule amendment workshops was to solicit comments from the public on the concepts proposed in amending Rule 6-3. The nine workshops were conducted in the following cities: Morgan Hill, Redwood City, Napa, Livermore, San Rafael, Santa Rosa, Walnut Creek, Suisun City, and San Francisco.

The Air District published a draft rule and staff report on the proposed amendments and the documents were available for an interim public comment period in mid-August. Public comments received were incorporated into the draft rule and staff report. The following is a summary of the public comments received during the interim public comment period:

- “Sole Source of Heat” definition is too vague and may allow un-intended wood burning during Winter Spare the Air days. Provide clarification in the definition or exemption section.
- “Sole Source of Heat” exemption requirement has significant economic impacts on households.
- Consider additional exemptions for low income households.
- Requiring EPA certified wood heaters to be installed to qualify for “Sole Source of Heat” exemption would encourage and promote the existence of wood burning devices for 30+ years and negatively impact air quality indefinitely.
- Increase enforcement on Winter Spare the Air Days instead of banning wood-burning. Take enforcement action on those gross polluters that do not comply with the rule rather than punish those who comply.
- A 30-day temporary exemption for non-functional heaters does not provide adequate time for households to make repairs.
- “Non-functional, permanently-installed heater” exemption is well-intended,

however, costs associated to repair a broken heater creates economic hardships for seniors or retirees. If a furnace cannot be repaired, a new one will have to be installed and many cannot afford the cost of installing a new device.

- Consider “Regional No Burn Days” versus a District-wide burn restriction.
- Consider a “Two-stage Burn Program” to help encourage households to upgrade to cleaner wood-burning devices.
- The continuation and reliance on wood fuel will have negative impacts on CO<sub>2</sub> emissions and climate change.
- Consider allowing EPA certified devices to be used on Winter Spare the Air days if a permanently installed gas furnace cannot be repaired to qualify for the “non-functional, permanently installed heater” exemption.
- Proposed effective date for real estate and rental disclosure requirement does not provide adequate time for industry to incorporate PM<sub>2.5</sub> health hazards into disclosure documents.
- A household should still qualify for “Sole Source of Heat” exemption even though propane fuel is available to a household.
- Special considerations or exemptions should be made for residents who reside in rural areas.
- Rule 6-3 should ban wood-burning in the Bay Area.
- EPA certified wood heaters should be disallowed as laboratory testing does not reflect actual emissions.
- EPA certified wood heaters are too heavily dependent on the operator and the performance of the device may be easily defeated through adjusting dampers.
- New Building Construction should continue to allow the installation of EPA certified wood heaters to provide consumers the choice of heating options.
- Banning wood-burning devices will have negative consequences during utility service outages where no natural gas or electricity is available.
- Consider exemption for unincorporated areas that are more rural and less densely populated.
- Consider banning the sale of unseasoned wood.
- Wood is a sustainable fuel and wood-burning devices should not be banned.

The Air District will prepare a Hearing Package that will be published on the Air District website and made available for a 30-day public comment period in mid-September. The final rule amendment is scheduled to be presented at an Air District Board of Directors meeting in October 2015 for adoption.

## **XII. CONCLUSION**

Pursuant to Section 40727 of the California Health and Safety Code, the proposed rule amendment must meet findings of necessity, authority, clarity, consistency, non-duplication, and reference. The proposed rule amendment is:

- Necessary to protect public health by reducing particulate matter emissions to meet the requirements of Senate Bill 656 Particulate Matter Implementation Schedule;
- Authorized by California Health and Safety Code Sections 40000, 40001, 40702, and 40725 through 40728;

- Clear, in that the new regulation specifically delineates the affected industry, compliance options, and administrative requirements for industry subject to this rule, so that its meaning can be easily understood by the persons directly affected by it;
- Consistent with other District rules, and not in conflict with state or federal law;
- Non-duplicative of other statutes, rules, or regulations; and
- Implementing, interpreting and making specific the provisions of the California Health and Safety Code sections 40000 and 40702.

### XIII. REFERENCES AND NOTATIONS

- 
- <sup>1</sup>Naeher, L. P., Brauer, M., Lipsett, M., Zelikoff, J. T, Simpson, C. D., Koenig, J. Q., & Smith, K. R. (2007). Woodsmoke health effects: A review. *Inhalation Toxicology*, 19, 67–106. Also: Bølling, A. K., Pagels, J., Yttri, K. E., Barregard, L., Sallsten, G., Schwarze, P. E., & Boman, C. (2009). Health effects of residential wood smoke particles: the importance of combustion conditions and physicochemical particle properties. *Particle and Fibre Toxicology*, 6(29). Retrieved from <http://www.particleandfibretoxicology.com/content/6/1/29>.
- <sup>2</sup> Bay Area Air Quality Management District. (2012). *Summary of PM Report*. Author.
- <sup>3</sup> Fairly, D. (2014). Analysis of Forest Knolls Aethalometer Data.
- <sup>4</sup> Sonoma Technology, Inc. (2014, June). Characterizing Wood Smoke in Santa Rosa. Retrieved from <http://www.sonomatech.com/project.cfm?uprojectid=1215>
- <sup>5</sup> The designation of the Bay Area as non-attainment for the 24-hour national PM<sub>2.5</sub> standard became effective on December 14, 2009. EPA published a “Determination of Attainment” for the San Francisco Bay Area in the Federal Register indicating that the Bay Area has attained the 2006 24-hour PM<sub>2.5</sub> NAAQS on January 9, 2013, however, the Air District has not yet submitted a redesignation request and maintenance plan to EPA; EPA approves the request.
- <sup>6</sup> Bay Area Air Quality Management District (2012, November). *Understanding Particulate Matter: Protecting Public Health in the San Francisco Bay Area*. Author.