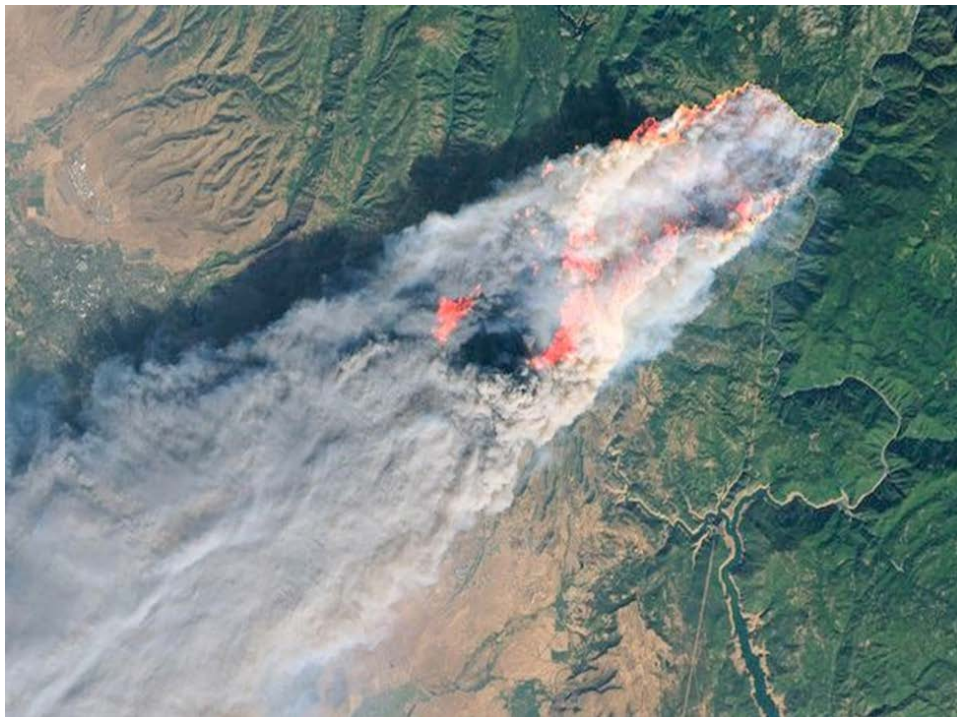




BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

## **Staff Report**

### **Proposed Amendments to Regulation 5: Open Burning and Regulation 6: Particulate Matter and Visible Emissions, Rule 3: Wood-Burning Devices**



Lead Rule Developer: Patrick E. Wenzinger, Supervising Air Quality Specialist  
Eliza J. Kane, Air Quality Specialist  
Tracy Lee, Manager

Compliance and Enforcement Division

November 2019

# ACKNOWLEDGEMENTS

Air District staff members who contributed to the development of this report and proposals:

## Compliance & Enforcement

John Marvin  
Juan Ortellado  
Jeff Gove

## Community Engagement

Kristina Chu  
Aneesh Rana  
Elizabeth Yura

## Meteorology & Measurement

Richard Lam  
Daniel Alrick  
Kate Hoag  
Charles Knoderer

## Communications Office

Tina Landis  
Kristine Roselius  
Aaron Richardson  
Lisa Fasano

## Rules & Strategic Policy

Laura Cackette  
David Joe  
Victor Douglas

## Assessment, Inventory, and Modeling

Tan Dinh  
Stephen Reid  
Sukarn Claire  
Phil Martien

## Administrative Resources

Jody Mackenzie

## Legal

Randi Wallach, Esq.  
Misha Nishiki, Esq.

## Executive Office

Wayne Kino  
Greg Nudd  
Judy Cutino, DO, PE  
Brian Bunger, Esq.

# CONTENTS

ACKNOWLEDGEMENTS .....	2
I. EXECUTIVE SUMMARY .....	4
II. BACKGROUND .....	6
A. Wildfire Behavior and Characteristics .....	6
B. Wildfire Smoke Composition .....	6
C. Health Hazards of Fine Particulate Matter (PM <sub>2.5</sub> ).....	7
D. Air Monitoring Network .....	8
E. Air Quality Impacts from Wildfires.....	9
III. PROPOSED AMENDMENTS TO REGULATION 5: OPEN BURNING .....	11
A. Clarification and Amendment of General (Reg 5, Section 100).....	13
B. Clarification and Amendment of Definitions (Reg 5, Section 200) .....	15
C. Clarification of Standards (Reg 5, Section 300) .....	15
D. Clarification of Administrative Requirements (Reg 5, Section 400).....	16
IV. PROPOSED AMENDMENTS TO REGULATION 6: PARTICULATE MATTER AND VISIBLE EMISSIONS, RULE 3: WOOD-BURNING DEVICES .....	17
A. Clarification and Amendment of Definitions (Rule 6-3, Section 200) .....	18
B. Amendment of Standards (Rule 6-3, Section 300) .....	19
V. EMISSIONS REDUCTIONS.....	19
A. Regulation 5 .....	20
B. Rule 6-3 .....	20
VI. ECONOMIC IMPACTS.....	21
A. Cost Effectiveness and Incremental Cost Effectiveness.....	21
B. Socioeconomic Impacts .....	21
C. District Impacts .....	21
VII. REGULATORY IMPACTS .....	22
VIII. ENVIRONMENTAL IMPACTS .....	22
IX. RULE DEVELOPMENT / PUBLIC PARTICIPATION PROCESS.....	23
X. CONCLUSION.....	24
XI. REFERENCES .....	24
XII. APPENDICES.....	26
A. Comments and Responses .....	26
B. Socioeconomic Analysis.....	26
C. CEQA Analysis .....	26

# I. EXECUTIVE SUMMARY

California experienced some of the deadliest and most destructive wildfires in its history over the last two years. Wildfire events are becoming the new normal and new wildfire prevention initiatives and actions are needed. Studies show that climate change is not only causing higher temperatures and longer dry periods, but also lengthening the fire season and increasing the risk of wildfires throughout the state.<sup>1,2</sup> Wildfires have the potential to destroy entire communities and burn everything in their path, producing a mixture of fine particulate matter and hazardous chemicals and compounds in the air we breathe.

Wildfire smoke presents immediate impacts to local air quality and public health, and atmospheric conditions can quickly transport smoke to affect the air quality of an entire region and even that of nearby states. The devastating fires in Napa and Sonoma County in 2017 and the Butte County Camp Fire in 2018 generated unprecedented levels of particulate matter, which reached hazardous levels never before experienced in the Bay Area. Wildfires are an imminent threat to air quality and public health in the Bay Area region and across the entire state.

Over the last year, in response to this unprecedented increase in wildfires, the Bay Area Air Quality Management District (Air District) developed the *Wildfire Air Quality Response Program (WAQRP)*, a comprehensive, multi-faceted program intended to prevent, prepare for, and respond to future wildfires, and to ensure that health-protective measures and strategies are in place during wildfire smoke events. One facet of the program is to ensure that Air District rules and regulations continue to protect and improve public health, air quality and the global climate.

To complement statewide wildfire prevention efforts, the Air District is proposing amendments to Regulation 5: Open Burning (Reg 5) and Regulation 6, Rule 3: Wood-Burning Devices (Rule 6-3). The proposed regulatory actions are consistent with new statewide initiatives and legislation intended to reduce the risk of catastrophic fires by implementing prescribed burning (e.g., SB1260 *Fire Prevention and Protection: Prescribed Burns*; SB901 *Wildfires*; Executive Order N-05-19)<sup>3</sup>. On March 22, 2019, Governor Newsom proclaimed a State of Emergency throughout California ahead of the upcoming fire season and directed the State to expedite fuel reduction projects in wildfire-vulnerable communities.<sup>4</sup> These initiatives have called for statewide support from air quality regulators and fire protection agencies to encourage prescribed burning to prevent catastrophic wildfires similar to those experienced in 2017 and 2018.

The Air District is proposing amendments to Reg 5 to reduce potential cost barriers associated with prescribed burning in alignment with statewide efforts to prevent larger, more destructive wildfires through increased prescribed burning. The proposed Reg 5 amendments would:

- Exempt public agencies from paying Open Burning Operation Fees when conducting prescribed burns for the purpose of wildfire prevention (Reg 5, Section 113).

---

<sup>1</sup> Flannigan et al., 2000.

<sup>2</sup> Westerling, 2016.

<sup>3</sup> In January 2019, Governor Newsom issued Executive Order N-05-19, which directed the California Department of Forestry and Fire Protection (CAL FIRE) to recommend immediate, medium, and long-term wildfire prevention measures. CAL FIRE published *The Community Wildfire Prevention and Mitigation Report* in February 2019.

<sup>4</sup> March 22, 2019 Proclamation of a State of Emergency, Executive Department, State of California.

- Clarify that Crop Replacement, Hazardous Material, Range Management and Forest Management fires larger than 10 acres constitute “prescribed burning” (Reg 5, Section 401.2, 401.6, 401.11, 401.12) and that prescribed burns are permissible year-round.
- Clarify other existing requirements in the Regulation.

The Air District is also proposing amendments to Rule 6-3 to further help protect public health and air quality when wildfire smoke affects air quality in the Bay Area. The proposed Rule 6-3 amendments would:

- Extend the Air District’s authority to ban wood burning or combustion in wood-burning devices year-round when particulate matter is forecast to exceed 35 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) (Reg 6, Rule 3, Sections 211, 224 and 301). The rule currently only prohibits wood burning during the wintertime (November – February) and the proposed amendment will allow the Air District to ban wood burning any time unhealthy levels of particulate matter are forecast, such as during an emergency wildfire event.
- Clarify other existing requirements in the Rule.

In preparing the proposed amendments, the Air District reviewed similar regulations in other air districts and consulted with interested stakeholders including the Bay Area Prescribed Fire Council, local units of California of Department Forestry and Fire Protection (CAL FIRE), local fire agencies, public land managers, and interested members of the public. In July 2019, Air District staff conducted a public workshop to discuss the proposed rule amendments. The comments received during the workshop and 30-day comment period have been considered by the Air District and changes have been incorporated into this proposal where appropriate. In addition to the proposed changes to Regulation 5 and Rule 6-3, the Air District is also working on several updates to streamline its prescribed burning review process that do not require changes to the regulatory language.

Potential environmental impacts from the proposed rule amendments were reviewed by Air District staff. The Air District staff determined the amendments are exempt from the provisions of the California Environmental Quality Act (CEQA), as discussed herein. Additionally, and in the alternative, the Air District analyzed the potential impacts from banning wood burning during high particulate matter days in 2008 and concluded that this action would result in environmental benefits and no significant adverse environmental impacts in a certified Environmental Impact Report. The Air District continues to rely on this certified Environmental Impact Report. The Air District intends to file a Notice of Exemption / Determination pursuant to State CEQA Guidelines.

A socioeconomic analysis on the proposed rule amendments was conducted by Bay Area Economics. The findings of that analysis indicate that the changes to Regulation 5 are not expected to have any impacts, and the changes to Regulation 6, Rule 3 are not expected to have a potential for significant impacts on businesses.

Air District staff recommends the Board of Directors adopt the proposed amendments to Regulation 5 and Rule 6-3 and approve filing a Notice of Exemption/Determination pursuant to CEQA at the Public Hearing scheduled for November 20, 2019.

## **II. BACKGROUND**

### **A. Wildfire Behavior and Characteristics**

Weather, terrain, fuel type and loading, and the stage of a fire can influence fire behavior and the impacts of its smoke plume. In general, windy conditions decrease smoke concentrations due to horizontal dispersion; however, windy conditions can also cause fires to spread more quickly, resulting in larger fires that produce more smoke. Regional weather patterns can dominate a fire's behavior for days and be the determining factor of where and how smoke may affect an area. For example, the October 2017 North Bay wildfires started during a Diablo wind event, when wind patterns in the Bay Area reversed to offshore, blowing from inland areas toward the coast, causing wildfire smoke to impact large portions of the Bay Area. These winds can also transport smoke over long distances into the Bay Area, as exemplified by the November 2018 Camp Fire in Butte County, which spread smoke across the Bay Area within hours of the fire's ignition even though the fire was located 200 miles away.

Terrain also influences fire behavior by altering wind flows. Mountains can cause turbulent airflow that may promote plume down-mixing and increased concentrations of ground-level smoke. In the evening wind speeds tend to be light and temperature inversions are common, especially in mountain valleys and low-lying areas. A temperature inversion occurs when the air near the ground is cooler than the air above, preventing upward air movement. These conditions favor smoke and pollutant accumulation in valleys at night.

The intense heat generated by a fire, especially soon after ignition, lofts smoke particulates high into the air that begin to descend when temperatures cool.<sup>5</sup> The amount of smoke produced during a fire is affected by how much fuel is available, the type of fuel and its moisture content. Initial fire plumes tend to be driven by high wind events, which can facilitate the prediction of smoke impacts downwind. As the smoke moves downwind, it dilutes and becomes widespread, eventually descending to ground level.

### **B. Wildfire Smoke Composition**

Wildfire smoke can contain a combination of hazardous chemicals and mixtures of microscopic particles that are products of incomplete combustion. The 2018 Camp Fire burned 153,336 acres (about 240 square miles) including the entire town of Paradise, with an approximate population of 27,000. Not only did trees, brush and vegetative material burn, but also approximately 18,800 structures and every object in its path.<sup>6</sup>

---

<sup>5</sup> United States Environmental Protection Agency, 2016.

<sup>6</sup> CAL FIRE, 2019. *Camp Fire Incident Report*.



Image 1. Camp Fire – Day 1, November 8, 2018 (GOES-16 Imagery).

The individual compounds present in wildfire smoke can number in the thousands. Different types of wood and vegetation are composed of varying amounts of cellulose, lignin, tannins and other polyphenols, oils, fats, resins, waxes and starches. Wildfire smoke can also include chemicals emitted from burning metals, plastics, shingles, asphalt, cement, insulation and fuels like gasoline. Finally, smoke composition depends on multiple factors including how efficiently a fuel burns, fuel type, moisture content, the fire temperature, wind conditions and other weather-related influences. When burned, these various fuels produce air contaminants that are released in the smoke.

### **C. Health Hazards of Fine Particulate Matter (PM<sub>2.5</sub>)**

Particulate matter is the principal pollutant of concern from wildfire smoke for relatively short-term exposures that range from hours to weeks. The health effects from particulate matter exposure can vary from one person to another based on an individual's health, age and duration of exposure. Particulate matter smaller than 10 micrometers (PM<sub>10</sub>) can irritate the eyes, nose and throat, while particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub> or "fine particulate") can pose serious health concerns as fine particulates can be inhaled deep into the lungs.

People with respiratory illnesses, children, and the elderly are more sensitive to the effects of PM<sub>2.5</sub>, but prolonged exposure can negatively affect everyone.<sup>7</sup> 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.<sup>8</sup> Healthy individuals can also experience acute effects from exposure to elevated levels of particulates in addition to these more serious health issues.

---

<sup>7</sup> Bølling et al, 2009.

<sup>8</sup> Bay Area Air Quality Management District, 2012.

## D. Air Monitoring Network

The Air District operates 17 PM<sub>2.5</sub> monitors throughout the Bay Area that continuously measure hourly particulate matter concentrations. These monitors were designed to track compliance with federal and state requirements, and are useful for tracking smoke impacts during wildfire events. Air District meteorologists provide daily air quality forecasts by analyzing PM<sub>2.5</sub> measurements, satellite imagery, as well as numerical weather and smoke prediction models to determine particulate matter levels in the region. During wildfire events, Air District meteorologists provide more frequent monitoring updates due to the variable nature of wildfire smoke plumes, with the intent to keep the public informed of the latest smoke impacts.



Image 2. Air District Monitoring Network.




## E. Air Quality Impacts from Wildfires

As the climate continues to warm and become drier, it is anticipated that the frequency of large wildfires will increase and negatively affect air quality in the Bay Area. In the last two years, eight of California's top 20 most destructive wildfires occurred (Figure 1). Three of these fires - the Tubbs, Nuns, and Atlas - were located in Bay Area counties.

**Top 20 Most Destructive California Wildfires**

FIRE NAME (CAUSE)	DATE	COUNTY	ACRES	STRUCTURES	DEATHS
1 <b>CAMP FIRE</b> (Under Investigation)	November 2018	Butte County	153,336	18,804	85
2 <b>TUBBS</b> (Electrical)	October 2017	Napa & Sonoma	36,807	5,636	22
3 <b>TUNNEL - Oakland Hills</b> (Rekindle)	October 1991	Alameda	1,600	2,900	25
4 <b>CEDAR</b> (Human Related)	October 2003	San Diego	273,246	2,820	15
5 <b>VALLEY</b> (Electrical)	September 2015	Lake, Napa & Sonoma	76,067	1,955	4
6 <b>WITCH</b> (Powerlines)	October 2007	San Diego	197,990	1,650	2
7 <b>WOOLSEY</b> (Under Investigation)	November 2018	Ventura	96,949	1,643	3
8 <b>CARR</b> (Human Related)	July 2018	Shasta County, Trinity County	229,651	1,614	8
9 <b>NUNS</b> (Powerline)	October 2017	Sonoma	54,382	1,355	3
10 <b>THOMAS</b> (Powerline)	December 2017	Ventura & Santa Barbara	281,893	1,063	2
11 <b>OLD</b> (Human Related)	October 2003	San Bernardino	91,281	1,003	6
12 <b>JONES</b> (Undetermined)	October 1999	Shasta	26,200	954	1
13 <b>BUTTE</b> (Powerlines)	September 2015	Amador & Calaveras	70,868	921	2
14 <b>ATLAS</b> (Powerline)	October 2017	Napa & Solano	51,624	783	6
15 <b>PAINT</b> (Arson)	June 1990	Santa Barbara	4,900	641	1
16 <b>FOUNTAIN</b> (Arson)	August 1992	Shasta	63,960	636	0
17 <b>SAYRE</b> (Misc.)	November 2008	Los Angeles	11,262	604	0
18 <b>CITY OF BERKELEY</b> (Powerlines)	September 1923	Alameda	130	584	0
19 <b>HARRIS</b> (Undetermined)	October 2007	San Diego	90,440	548	8
20 <b>REDWOOD VALLEY</b> (Powerline)	October 2017	Mendocino	36,523	546	9



3/14/2019

\*\*\*Structures\* include homes, outbuildings (barns, garages, sheds, etc) and commercial properties destroyed.  
 \*\*\*This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.

Figure 1. Top 20 Most Destructive California Wildfires (CAL FIRE).

The 2017 and 2018 wildfires produced 16 of the 20 highest PM<sub>2.5</sub> concentrations measured in the Bay Area since measurements began in 1999 (Figure 2).

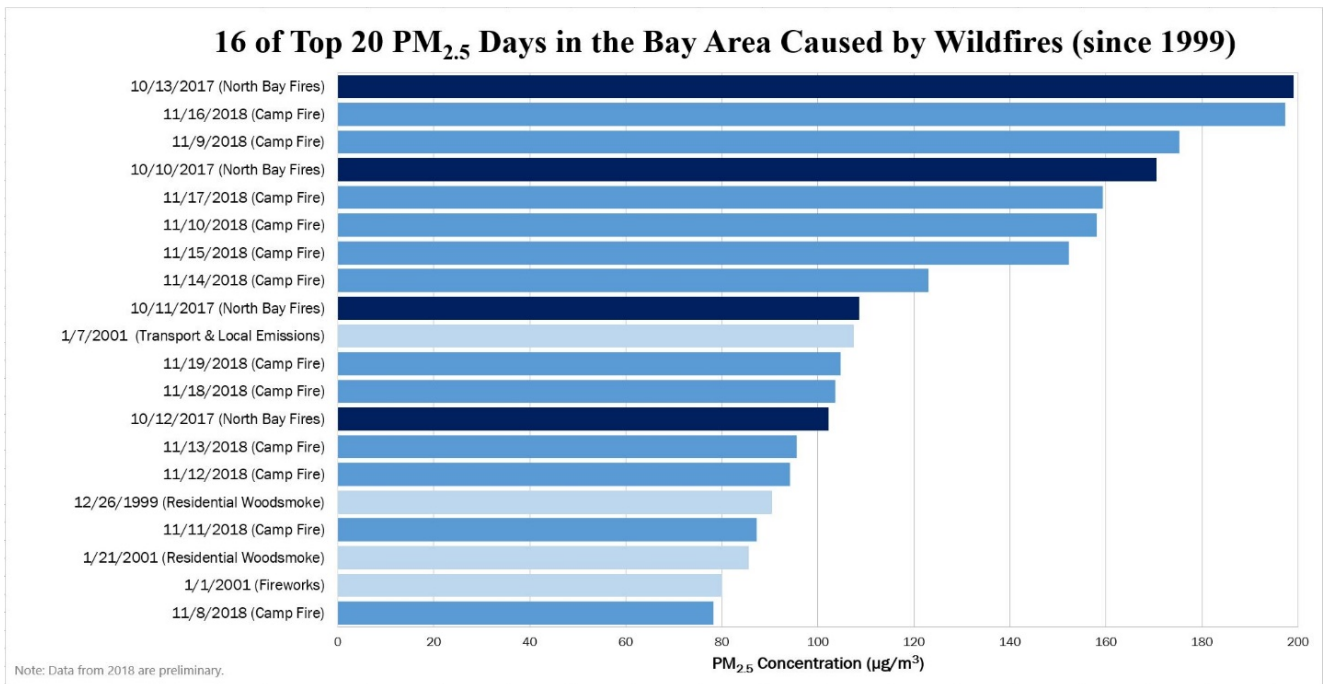


Figure 2. Top 20 24-hour average PM<sub>2.5</sub> concentrations in the Bay Area.

The November 2018 Butte County Camp Fire accounted for 12 of those Top 20 PM<sub>2.5</sub> days, with daily average PM<sub>2.5</sub> levels in the Bay Area ranging from 78 µg/m<sup>3</sup> to 197 µg/m<sup>3</sup> during this event, even though the fire was burning nearly 200 miles away. The federal EPA considers ambient levels of PM<sub>2.5</sub> higher than 35 µg/m<sup>3</sup> to be unhealthy; this is the level at which the National Ambient Air Quality Standard (“NAAQS”) is set. During the 2018 Camp Fire, particulate matter concentrations in the Bay Area were elevated from November 8<sup>th</sup> through the 21<sup>st</sup> with numerous instances of hourly PM<sub>2.5</sub> concentrations reaching “Very Unhealthy” (greater than 150 µg/m<sup>3</sup>) to “Hazardous” (greater than 250 µg/m<sup>3</sup>) levels (Figure 3). The fire created a public health emergency; the Bay Area suffered under a haze of unhealthy smoke for nearly two weeks.

In California, the amount of area that burns annually has increased due to a higher frequency and sizes of wildfires. California has experienced a fivefold increase in annual area burned during 1972-2018, mainly due to an eightfold increase in summer forest fires.<sup>9</sup> Climate change has contributed to the increase in area burned due to rising temperatures that dry out fuels and create drier atmospheric conditions. In the Bay Area, higher temperatures and lower amounts of warm-season rainfall increase fire risk, especially during the fall when strong offshore Diablo winds can quickly dry fuels and spread wildfires when they occur. An abundance of dry fuels is one of the clearest links between increased California wildfire activity and climate change.<sup>9</sup> Wildfires can also contribute to climate change in two main ways. Wildfires reduce forests and vegetation that sequester CO<sub>2</sub> from the atmosphere, and wildfires can emit a significant amount of greenhouse gases.<sup>10</sup> California’s lands are a net greenhouse gases source, meaning that the lands are losing more carbon than they are sequestering. Wildfires are the largest cause of this carbon loss.<sup>11</sup>

<sup>9</sup> Williams et al., 2019.

<sup>10</sup> Khadka, Navin Singh. “Climate change: Worries over CO<sub>2</sub> emissions from intensifying wildfires,” *BBC World Service*, November 15, 2018, World Service, Science & Environment. <https://www.bbc.com/news/science-environment-46212844>

<sup>11</sup> California Air Resources Board, Draft January 2019.

Most climate projections indicate that temperatures will continue to rise, which will further increase wildfire activity in California.

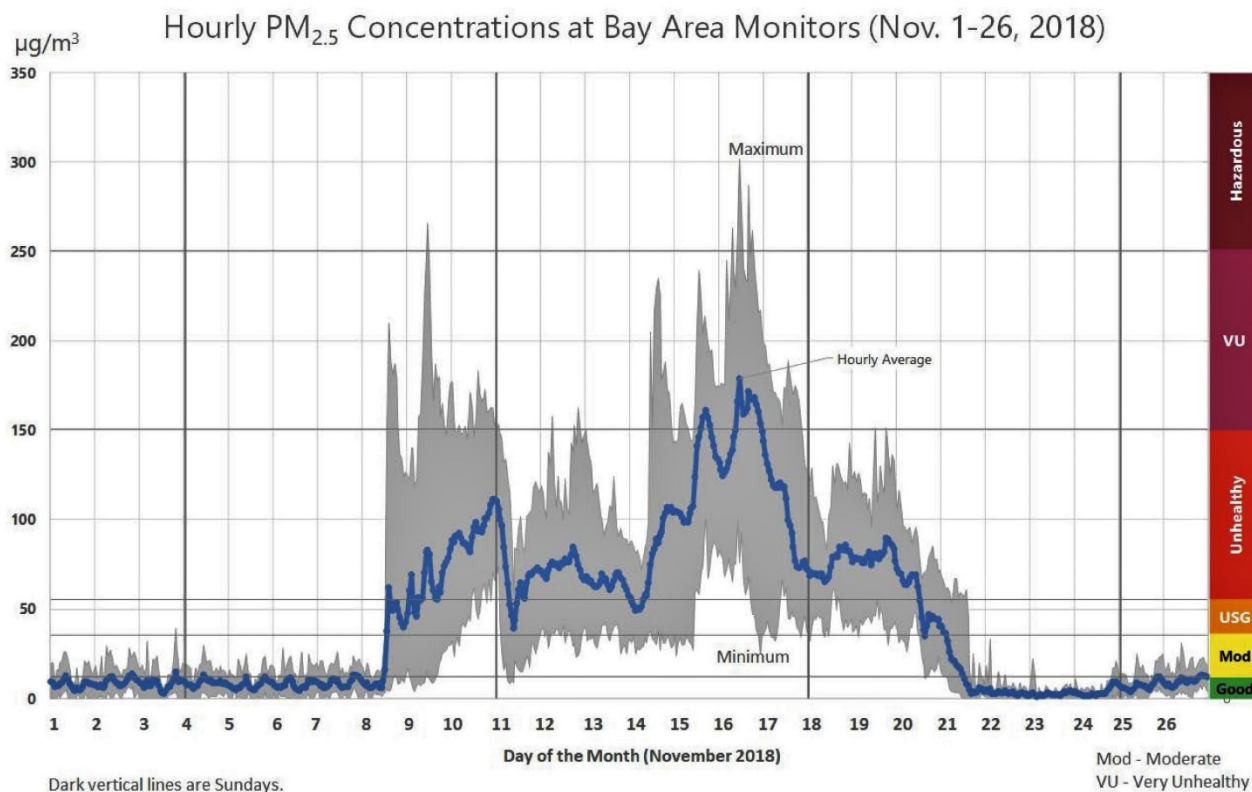


Figure 3. Hourly PM<sub>2.5</sub> concentrations at Bay Area monitors from November 1 - 26, 2018.

### III. PROPOSED AMENDMENTS TO REGULATION 5: OPEN BURNING

Outdoor fires, also known as open burning, produce an average of 175 tons of PM<sub>2.5</sub> per year in the air we breathe in the Bay Area.<sup>12</sup> To minimize the impact on public health, Air District Reg 5 prohibits open burning. However, there are 17 types of fires that are conditionally allowed on designated permissive burn days and during predetermined permissive burn periods for the specific fire types. Permissive burn days are days when weather conditions are favorable for smoke dispersion. The allowable fires are primarily agricultural burns; however, there are several non-agricultural fire types.

One allowable fire type is "prescribed burning," which is the planned, controlled application of fire to vegetation to achieve specific natural resource management objectives, including wildfire prevention and ensuring fire safety. Prescribed burns are designed to burn less intensely than wildfires and are ignited amid controlled conditions to minimize potential smoke impacts. Wildfire events are more likely to result in harmful air quality and public health impacts than prescribed

<sup>12</sup> California Emissions Projection Analysis Model 2016.  
<https://www.arb.ca.gov/app/emsmv/fcemssumcat/fcemssumcat2016.php>

burning because wildfires are unplanned and typically larger compared to prescribed burns. Wildfires tend to last longer and burn more vegetation per acre than prescribed burns.<sup>13</sup>

In addition to fuel reduction benefits, prescribed burning also restores the structure and composition of forest ecosystems. Prescribed burns operate at lower temperatures than wildfires and decrease the likelihood that damaging, severe wildfire emergency events will occur.<sup>14</sup> Wildfires can reach such high temperatures and intensity that they completely consume and destroy ecosystems, effectively sterilizing the burned area. Prescribed burns, however, make forest environments healthier, more stable, and more resilient to change. Due to historical fire suppression efforts, many forests in California contain excess amounts of vegetation that serve as fuel and, as a result, are highly susceptible to catastrophic wildfires. Prescribed burning is an effective way to reduce the potential for destructive emergency wildfire events and maintain healthy forest ecosystems.<sup>15</sup>

Air District Regulation 5 permits prescribed burning. Several fire types are regulated as prescribed burning, which is also referred to as “Wildland Vegetation Management fires” in Reg 5 (Reg 5-401.15). As discussed below, Crop Replacement, Range Management, Forest Management and certain Hazardous Material fires that are larger than 10 acres are regulated as Wildland Vegetation Management (Prescribed Burning) fires and are subject to Reg 5-401.15.

Any person seeking to conduct a prescribed burn must submit a smoke management plan, receive written approval from the Air District, and pay associated fees prior to burning. Reg 5 currently requires the plan to include a smoke management prescription, which includes measurable criteria when a prescribed burn may be ignited. Prescription criteria may include, but are not limited to, procedures to minimize smoke impacts, as well as safety, economic, public health, environmental, geographic, administrative, social or legal considerations. The Air District reviews smoke management plans to ensure prescribed burns are conducted during specific meteorological conditions that achieve favorable smoke dispersion and limits negative impacts to surrounding communities. The prescribed burns are only permitted when the Air District meteorologists determine it is a permissive burn day. This is necessary to protect the public health and air quality.

During the workshop process, the Air District received comments requesting that it be more flexible regarding scheduling and approval of prescribed burns. Air District staff are reviewing current policies and procedures to streamline the Prescribed Burning Program. Staff are also working with the California Air Resources Board to integrate the Air District’s existing program into the statewide Prescribed Fire Information Reporting System (PFIRS). PFIRS serves as an interface between air quality managers, land management agencies, and individuals that conduct prescribed burning in California. The web tool facilitates communications by providing access to a database containing information on burn planning, burn approvals, and emissions information. The integration of the Prescribed Burning Program into the PFIRS system does not require an amendment to Reg 5.

The Air District must continue to review and approve smoke management plans prior to authorizing prescribed burns. If the Air District failed to review and approve the meteorological prescriptions in smoke management plans prior to approving them, Bay Area residents could face hazardous levels of smoke from prescribed burns that are performed during weather conditions that are not favorable for smoke dispersion.

---

<sup>13</sup> Berger et al, 2018.

<sup>14</sup> Fernandes and Botelho, 2003.

<sup>15</sup> California Air Resources Board, Draft January 2019.

On the day before the planned burn, the burn manager requests a burn allowance and acreage allocation from the Air District. On the morning of the planned burn, the Air District meteorologists review these requests based on the weather conditions for that day. If approved, the burn manager receives the acreage allocation from the Air District and the burn manager may conduct the burn in accordance with a District-approved smoke management plan. Prescribed burns are permissible year-round.

In California, the rate of fuel reduction projects through prescribed burning, fuel treatment, and thinning of forests averages approximately 250,000 acres per year. In 2018, Governor Brown directed the State to double its efforts within five years to at least 500,000 acres per year.<sup>16</sup>

Due to these statewide efforts to prevent wildfires, fuel reduction projects are expected to sharply increase throughout the next few years and beyond. While it is uncertain how many additional prescribed burns by public agencies the Air District will review, the Air District intends to support wildfire prevention measures taken to reduce fuels to prevent larger, more catastrophic wildfires that can create public health emergencies. The Air District proposes to amend Reg 5 to eliminate fees to public agencies that conduct prescribed burning for wildfire prevention for the benefit of the public and environment. The amendments are consistent with CAL FIRE's report *Community Wildfire Prevention and Mitigation Report*,<sup>17</sup> which recommends CAL FIRE coordinate with air quality regulators to enable increased use of prescribed burning and to help reduce costs and complexities for the burners.

The Air District recognizes the role that prescribed burning plays in wildfire prevention. The fuel reduction and ecological benefits of prescribed burning are known, and the increased use of prescribed burning as a land management practice is necessary to prevent the types of devastating wildfires experienced in 2017 and 2018.

The section below provides a description of the proposed amendments to Reg 5.

## **A. Clarification and Amendment of General (Reg 5, Section 100)**

The Air District proposes to clarify and add exemptions to Reg 5:

### **Rename "Conditional Exemptions" to "Special Conditions for Allowable Fires" (Section 111)**

The existing "Conditional Exemptions" are a set of special conditions that must be met for the allowable fires (Reg 5, Section 401). The conditions must be complied with during any allowable fire. These include, but are not limited to burn start time, burn termination, material conditions, and ignition methods. The Air District proposes to rename the existing section of "Conditional Exemptions" to "Special Conditions for Allowable Fires." The amendment is administrative and intended to clarify that these conditions for allowable fires are not exemptions. It would not change the intended purpose of the section.

### **Limited Exemption, Public Agency Wildfire Prevention (Section 113)**

The Air District proposes to amend Reg 5 by adding a limited exemption for any public agency conducting a prescribed burn for the purpose of wildfire prevention as approved by the Air

---

<sup>16</sup> Governor Brown issued Executive Order B-52-18 in May 2018 to improve forest and community resilience to wildfire and other climate impacts.

<sup>17</sup> <http://www.fire.ca.gov/downloads/45-Day%20Report-FINAL.pdf>



District. The proposed amendment complements statewide efforts by removing potential barriers to prescribed burning conducted for wildfire prevention purposes. It would exempt a public agency from having to pay an Open Burning Operation Fee, as required by Reg 5, Section 411. This exemption would also apply when a public agency conducts prescribed burning for wildfire prevention on land owned by a private entity or non-profit organization as long as there is a cooperative agreement or contract between the public agency and landowner.

In 2013, the Board of Directors adopted Regulation 3, Schedule V: Open Burning, which established open burning fees for each type of fire allowed pursuant to Reg 5.<sup>18</sup> A person conducting one of the allowable fires,<sup>19</sup> is required to pay the associated operation fee (Reg 5, Section 411). Currently, prescribed burn fee amounts are based on the proposed acreage to be burned. The Wildland Vegetation Management Fire fee, as outlined in Regulation 3, Schedule V, is the fee associated with prescribed burns.<sup>20</sup>

In the past ten years, prescribed burning in the Bay Area conducted by public agencies peaked in 2010 at 2,331 acres and has been steadily declining ever since (Figure 4). After 2013, the total number of smoke management plans submitted to the Air District decreased, but the total acreage burned has remained consistent to previous years. In the past ten years, a majority of smoke management plans were submitted by public agencies, and the Air District anticipates this trend to continue.

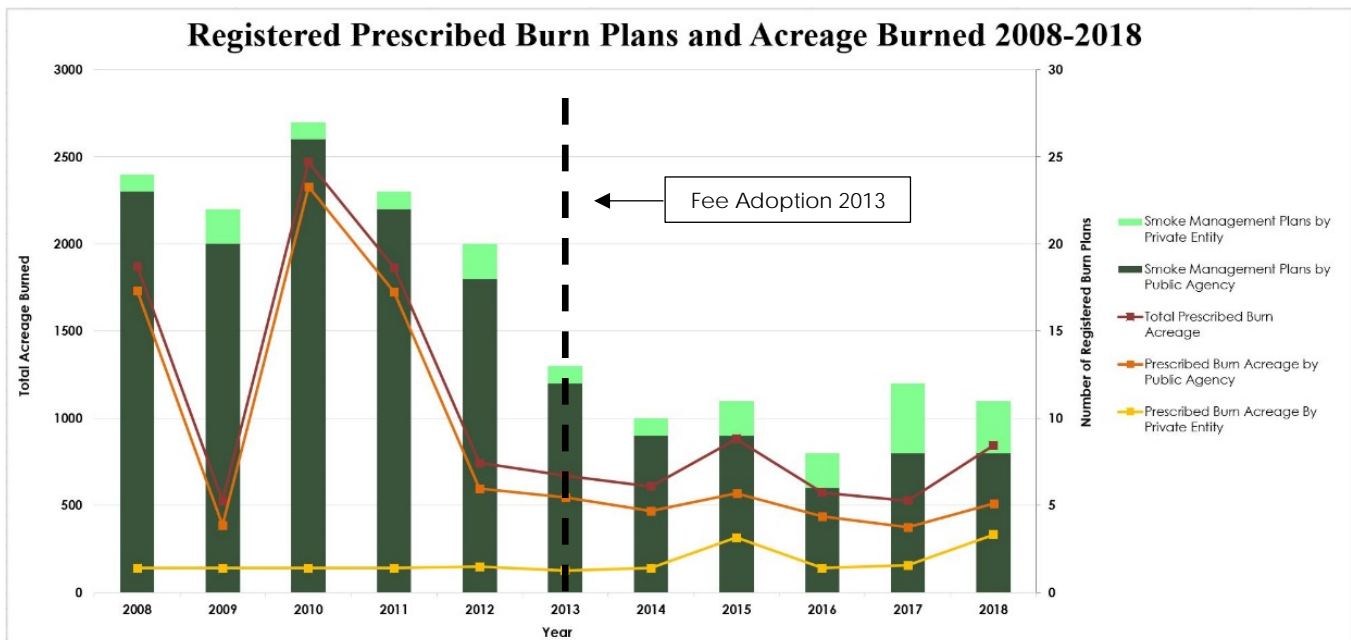


Figure 4. Registered Prescribed Burn Plans and Acreage Burned in the Bay Area (2008 – 2018).

<sup>18</sup> BAAQMD Regulation 3 Fees: Schedule V: Open Burning. <http://www.baaqmd.gov/~media/dotgov/files/rules/archive-2018-regulation-3/documents/rg-0300-2018-pdf.pdf?la=en>.

<sup>19</sup> See Regulation 5, Section 401

<sup>20</sup> As of July 1, 2019, the fee is \$602 for a proposed Wildland Vegetation Management Fire project less than or equal to 50 acres; \$816 for a proposed project 50 acres to 150 acres; and \$1,062 for a proposed project greater than 150 acres.

Since the fee schedule went into effect in July 2013, the Air District has collected approximately \$20,772 in Wildland Vegetation Management Fire fees from 45 prescribed burn applications submitted by public agencies (Table 1). On an annual basis, the Wildland Vegetation Management Fire Fees received from public agencies are less than 3% of all of the Open Burning Fees collected. The Air District does not anticipate this fee exemption to significantly impact program revenue; it is intended to complement statewide efforts to remove potential cost barriers associated with prescribed burning for wildfire prevention.

	2013	2014	2015	2016	2017	2018	Total
<b>Fees Paid</b>	\$3,400	\$4,075	\$2,214	\$3,925	\$3,463	\$3,695	<b>\$20,772</b>
<b>Plans Submitted</b>	5	9	9	6	8	8	<b>45</b>

Table 1: Total fees paid and plans submitted by public agencies to conduct prescribed burning since fee adoption.

## B. Clarification and Amendment of Definitions (Reg 5, Section 200)

The Air District proposes to clarify and add definitions to Reg 5 to support the rule amendments:

### Hazardous Material (Section 208)

The Air District proposes to remove the “For purposes of this Regulation” because the language is redundant. The proposed change is administrative and would not change the intended definition or purpose.

### Mandatory Burn Ban (Section 223)

Reg 5 currently defines “Curtailed Period” as any period so declared to the public by the Air Pollution Control Officer (APCO) when a negative public health impact is anticipated from burning. The Air District proposes to rename “Curtailed Period” to “Mandatory Burn Ban” to be consistent with Regulation 6, Rule 3: Wood-Burning Devices Section 211. The proposed change is administrative and would not change the intended definition or purpose.

### Public Agency (Section 225)

The proposed amendment adds the definition of a “Public Agency” to the regulation; a term that is used in the proposed limited exemption (Reg 5, Section 113) that exempts a public agency conducting a prescribed burn for the purpose of wildfire prevention from paying fees as required by Reg 5, Section 411.

## C. Clarification of Standards (Reg 5, Section 300)

The Air District proposes to clarify a standard in Reg 5:

### Mandatory Burn Ban for Recreational Fires (Section 302)

The Air District proposes to clarify that no person shall ignite or maintain any recreational fire during Mandatory Burn Ban periods. A recreational fire is a fire that is used for social, cultural, or other activities. Campfires and bonfires are examples of recreational fires. The Air District proposes to rename “Mandatory Curtailed” to “Mandatory Burn Ban” to be consistent with Reg 5, Section 223. The proposed change is administrative and does not change the intended definition or purpose.

## D. Clarification of Administrative Requirements (Reg 5, Section 400)

The Air District proposes to clarify administrative requirements in Reg 5:

### **Allowable Fires: Crop Replacement (Section 401.2), Hazardous Material (Section 401.6), Range Management (Section 401.11), Forest Management (Section 401.12)**

The Air District proposes to amend the Crop Replacement, Hazardous Material, Range Management and Forest Management fire types subsections by adding existing language from the “Prescribed Burning” definition (Reg 5, Section 213) to clarify that they are regulated as Wildland Vegetation Management (Prescribed Burning) fires (Reg 5, Section 401.15) when they are larger than 10 acres. During the workshop, some commenters expressed concern and confusion over the available burn windows and restrictions on certain types of prescribed burning. These amendments are intended to clarify that all prescribed burning plans are reviewed independently by the Air District and there are no set dates during which they must be conducted. Rather, prescribed burning may be conducted on any day so long as meteorological conditions are favorable such that it is a permissive burn day and the prescribed burn is conducted in accordance with an approved smoke management plan.

Specifically, the Air District will delineate within each subsection that certain fires greater than 10 acres in size, including any Crop Replacement fire, Range Management fire, Forest Management fire, and certain Hazardous Material fires, are considered prescribed burning and regulated as a Wildland Vegetation Management (Prescribed Burning) (Reg 5, Section 401.15) allowable fire. Prescribed burns are permissible year-round and must be conducted in accordance with an Air District-approved smoke management plan. Small fires (10 acres or smaller) are still subject to the Crop Replacement, Hazardous Material, Range Management and/or Forest Management requirements, as applicable. The proposed changes are administrative and would not change the intended definitions or purpose.

### **Allowable Fires: Marsh Management (Section 401.13)**

Reg 5 currently limits Marsh Management fires to a Spring permissive burn period beginning February 1<sup>st</sup> and ending March 31<sup>st</sup>, and if heavy rainfall prevents a Spring burn season, the APCO has the authority to extend the season until June 30. In 2009, the Air District developed a policy to modify the Spring burn season to begin on March 1<sup>st</sup> and end on April 15<sup>th</sup> based on the marsh bird nesting season and guidance from the California Department of Fish and Wildlife.<sup>21</sup> The Air District proposes to change the permissive burn period in Reg 5 to begin March 1<sup>st</sup> and end on April 15<sup>th</sup> to ensure consistency with the policy.

### **Allowable Fires: Wildland Management (Section 401.15)**

The Wildland Vegetation Management fire type is currently defined in Reg 5, Section 401.15 as “prescribed burning by a state or federal agency or through a cooperative agreement involving the state or federal agency.” The Air District proposes to replace “state or federal” agency with “public” agency to be consistent with the proposed limited exemption for public agencies (Reg 5, Section 113).

---

<sup>21</sup> BAAQMD Compliance & Enforcement Advisory 2009. [http://www.baaqmd.gov/~media/files/compliance-and-enforcement/advisories/open-burning/changes\\_to\\_spring\\_marsh\\_burn\\_season\\_final.pdf?la=en](http://www.baaqmd.gov/~media/files/compliance-and-enforcement/advisories/open-burning/changes_to_spring_marsh_burn_season_final.pdf?la=en)



The Air District also proposes to add clarifying language that the burner shall comply with the approved smoke management plan. This change is consistent with the Air District published policies and procedures for the Open Burning program and is intended to clarify an existing requirement.<sup>22</sup>

The Air District also proposes to remove references to dates that have already occurred. The proposed change is administrative and would not change the intended definition or purpose.<sup>23</sup>

#### **Wildland Vegetation Management Burn Requirements (Section 408)**

The Air District proposes to remove references to dates that have already occurred. The proposed change is administrative and would not change the intended definition or purpose.

#### **Open Burning Operation Fees (Section 411)**

Reg 5 requires any person who conducts an allowable fire to pay an associated burn fee. The requirement currently does not specify when an applicant must pay the fee. The amendment is administrative and intended to clarify that the operation fee must be paid prior to burning.

## **IV. PROPOSED AMENDMENTS TO REGULATION 6: PARTICULATE MATTER AND VISIBLE EMISSIONS, RULE 3: WOOD-BURNING DEVICES**

The purpose of Rule 6-3 is to protect public health by limiting emissions of particulate matter and visible emissions from wood-burning devices used for primary heat, supplemental heat or ambiance. When air quality is forecast to be unhealthy due to elevated levels of fine particulate matter, the rule allows the Air District to announce a Winter Spare the Air Alert and issue a Mandatory Burn Ban during the months of November through February to prohibit wood burning (Rule 6-3, Sections 211, 227, and 301). When particulate matter concentrations are forecast to exceed the federal NAAQS - 35 µg/m<sup>3</sup> in the wintertime, the Air District bans wood burning to protect public health.<sup>24</sup>

When wood and other solid fuels are burned, the smoke emitted contains fine particulates, PM<sub>2.5</sub>, that can penetrate deep into the lungs and cause serious health problems such as difficulty breathing, aggravated asthma and even premature death for people with heart or lung disease. Winter weather conditions, such as atmospheric inversions, can trap wood smoke close to the ground, concentrating air pollution to unhealthy levels. When these conditions occur, wood smoke accounts for the largest portion of wintertime fine particulate matter in the Bay Area.

The Air District recognizes that wildfires are becoming the new normal and is proposing amendments to Rule 6-3 to further protect public health year-round. As demonstrated by the Camp Fire, which occurred during November 2018, wildfires are not limited to the summer months and may occur at any time of the year. As discussed above, wildfires can cause air quality to be unhealthy and PM<sub>2.5</sub> levels to reach hazardous levels at times. If Bay Area residents were to burn wood during wildfire events, they would be contributing additional particulate matter to already

---

<sup>22</sup> BAAQMD Compliance & Enforcement Division 2019. *Policy and Procedures Open Burning Regulation 5*. [http://www.baaqmd.gov/~media/Files/Compliance%20and%20Enforcement/Policies%20and%20Procedures/reg5\\_guidelines\\_102003.ashx?la=en](http://www.baaqmd.gov/~media/Files/Compliance%20and%20Enforcement/Policies%20and%20Procedures/reg5_guidelines_102003.ashx?la=en)

<sup>23</sup> See Regulation 5, Section 401.15.

<sup>24</sup> Bay Area Air Quality Management District, 2008.

unhealthy air, exacerbating the existing public health emergency. The proposed amendments to Rule 6-3 would allow the Air District to prohibit wood burning throughout the year whenever particulate matter concentrations are forecast to exceed 35  $\mu\text{g}/\text{m}^3$ .

The proposed rule changes do not affect the existing limited exemptions that allow wood burning when a Mandatory Burn Ban is in effect. Rule 6-3 limited exemptions for Sole Source of Heat (Section 110), Non-functional, Permanently Installed Heater (Section 111) and Loss of Natural Gas and/or Electric Power (Section 112) will continue to allow people who meet the limited exemption applicability, and who have registered EPA certified wood heaters (Section 404), to use a wood-burning device.

This section provides a description of the proposed amendments to Rule 6-3.

## **A. Clarification and Amendment of Definitions (Rule 6-3, Section 200)**

The Air District proposes to amend the following definitions to support the rule amendments:

### **Mandatory Burn Ban (Section 211)**

Currently, Rule 6-3 defines “Mandatory Burn Ban” as any period during which the air quality is forecast by the Air District to be unhealthy due to ambient levels of particulate matter and burning wood or any solid fuels is illegal in the Bay Area. The definition also specifies that a Mandatory Burn Ban is announced through a Winter Spare the Air Alert.

The Air District proposes to clarify the definition of a Mandatory Burn Ban by adding reference to the 24-hour  $\text{PM}_{2.5}$  federal health standard of 35  $\mu\text{g}/\text{m}^3$ . This is an administrative change as the  $\text{PM}_{2.5}$  federal health standard is currently referenced in the definition of Winter Spare the Air Alert of the existing rule. There is no change to the  $\text{PM}_{2.5}$  federal health standard of 35  $\mu\text{g}/\text{m}^3$ .

Within the definition of Mandatory Burn Ban, the Air District also proposes to change how a Mandatory Burn Ban is announced by removing the word “winter” from “Winter Spare the Air Alert.” The proposed amendment clarifies that a Mandatory Burn Ban may be imposed whenever  $\text{PM}_{2.5}$  concentrations are forecast to exceed 35  $\mu\text{g}/\text{m}^3$ , regardless of the season. This proposed amendment is consistent with the proposed change in Section 224, Spare the Air Alert definition.

### **Rename “Winter Spare the Air Alert” to “Spare the Air Alert” (Section 224)**

The purpose of the existing “Winter Spare the Air Alert” is to notify the general public when wood burning is prohibited due to anticipated unhealthy air quality from elevated  $\text{PM}_{2.5}$  concentrations. The Air District proposes to rename the existing definition of “Winter Spare the Air Alert” to “Spare the Air Alert.” Removing the word “Winter” and renaming to “Spare the Air Alert” will allow the Air District to issue a Mandatory Burn Ban any time the Bay Area is forecast to be impacted by elevated concentrations of particulate matter. The proposed amendment also removes the 24-hour  $\text{PM}_{2.5}$  federal health standard of 35  $\mu\text{g}/\text{m}^3$ , which has been moved to the “Mandatory Burn Ban” definition (Section 211).

### **Remove “Winter Spare the Air Season” Definition (Section 228)**

The Air District proposes to remove the definition of “Winter Spare the Air Season” to align with the proposed modifications to Sections 211 and 224. The removal of Section 228 would allow a “Spare the Air Alert” to be called any time the air quality in the Bay Area is forecast to be

unhealthy due to elevated levels of fine particulate matter. The purpose of this modification is to recognize that wildfires and associated particulate matter impacts can occur year-round.

## **B. Amendment of Standards (Rule 6-3, Section 300)**

The Air District proposes to amend the following standard:

### **Mandatory Burn Ban (Section 301)**

Rule 6-3 currently prohibits wood burning in the Bay Area during the months of November through February when air quality is forecast to exceed the 24-hour PM<sub>2.5</sub> federal health standard of 35 µg/m<sup>3</sup>. To protect public health, the Air District announces a Winter Spare the Air Alert to notify the public that a Mandatory Burn Ban is in effect and burning wood or any other solid fuels is prohibited.

The Air District proposes to rename the “Mandatory Burn Ban” standard in Section 301 to “Burning Prohibited During Mandatory Burn Ban” to differentiate it from the “Mandatory Burn Ban” definition (Section 211). Since wildfires are unpredictable, emergency events that can occur at any time of the year and are not limited to the months of November through February, the Air District is also proposing to make the standard applicable year-round to better protect the health of Bay Area residents. The proposed amendment would extend the Air District’s authority to announce a Spare the Air Alert to issue a Mandatory Burn Ban any time PM<sub>2.5</sub> concentrations are forecast to exceed 35 µg/m<sup>3</sup>. This change would ensure that air quality during wildfire events is not further exacerbated by wood-burning activities.

The proposed amendments are necessary to enhance enforceability of the rule and discourage individuals from operating wood-burning devices when the Bay Area is already being impacted by elevated particulate matter concentrations. In November 2018, the Air District issued a Winter Spare the Air Alert and Mandatory Burn Ban pursuant to Rule 6-3 due to the smoke impacts from the Butte County Camp Fire. The Burn Ban resulted in the issuance of 35 Notices of Violation to individuals who burned during the Mandatory Burn Ban. It is important to note that the Air District’s ability to issue the Notices of Violation was only possible because the wildfire occurred during the Winter Spare the Air Season (November – February). The proposed amendments would give the Air District authority to prohibit wood-burning activities should the Bay Area experience another devastating wildfire smoke event outside of the winter season.

Based on historical meteorology and emissions data, the Air District anticipates that projected PM<sub>2.5</sub> exceedances and associated Mandatory Burn Bans would likely only occur during the wintertime (due to residential wood smoke) or when smoke from wildfires events impact the region. The Air District has never exceeded the federal PM<sub>2.5</sub> standard outside of wintertime and wildfire-related PM<sub>2.5</sub> events.

## **V. EMISSIONS REDUCTIONS**

This section discusses the estimated changes in emissions as a result of the proposed amendments.

## A. Regulation 5

In 2018 the Governor directed the State to increase the number of fuel reduction projects through prescribed burning, fuels treatment, and thinning of forests, and asked for regulators to align with statewide efforts. The Air District anticipates an increase in prescribed burning acreage and associated PM<sub>2.5</sub> emissions from controlled burns due to statewide fuel reduction projects; however, the Air District's proposal to exempt Open Burning Operation Fees does not increase, or have an impact on PM<sub>2.5</sub> emissions. Based on discussions with representatives from public agencies in the Bay Area that conduct prescribed burns, the Air District expects prescribed burning to increase whether or not it exempts public agencies from its Open Burning Operation Fees.

The Air District estimates that in 2017, the entire Open Burn program in the Bay Area generated a total of 175 tons of PM<sub>2.5</sub>, which accounts for emissions from all 17 allowable fire types in Reg 5.<sup>25</sup> Prescribed burning is one of the 17 allowable fire types, and accounts for only a small fraction of the total PM<sub>2.5</sub> emissions. In 2017, 527 acres were burned through prescribed burning, which generated 6.45 tons of PM<sub>2.5</sub> emissions. In contrast, the 2017 North Bay wildfires (Tubbs, Nuns, and Atlas) burned approximately 155,000 acres in total and emitted approximately 49,000 tons of PM<sub>2.5</sub>.<sup>26</sup>

Controlled, prescribed burning has the potential to reduce PM<sub>2.5</sub> emissions from catastrophic wildfire by reducing the amount of available fuel, but quantifying wildfire emission reductions from fuel reduction projects is not possible since wildfires are unpredictable, and there is not a comparable baseline of emission reductions.<sup>27, 28</sup>

## B. Rule 6-3

The Air District's proposal to prohibit wood-burning activities year-round, beyond the winter months of November – February when PM<sub>2.5</sub> concentration is projected to exceed 35 ug/m<sup>3</sup>, is expected to further reduce PM<sub>2.5</sub> emissions. The following emissions reduction calculations were performed by Air District staff using the 2011 emissions inventory and Bay Area survey data regarding woodburning patterns and frequency and assumes uniform burning throughout each day of the period between March 1 and October 31 of a given year, as well as a 100 percent compliance rate when the Air District prohibits wood burning through a Mandatory Burn Ban.

The Air District estimates that the proposed amendment to extend a Mandatory Burn Ban year-round would reduce PM<sub>2.5</sub> emissions by an average of approximately 3.5 tons per day. This estimate is specifically for emissions reductions during the months of March through October and is based on the non-wintertime PM<sub>2.5</sub> emissions inventory. Based on the historical evaluation of PM<sub>2.5</sub> exceedances of 35 ug/m<sup>3</sup>, the Air District expects that projected PM<sub>2.5</sub> exceedances and resultant Mandatory Burn Bans will likely only occur during the months of March through October if smoke from wildfire events impact the region. Between 2015 and 2018, wildfire smoke caused the Bay Area to exceed the PM<sub>2.5</sub> standard of 35 ug/m<sup>3</sup> a total of 33 times. Of these 33 days, 19 days occurred during the months of March through October. Averaging the 19 days over a 4-year

---

<sup>25</sup> California Emissions Projection Analysis Model 2016.

<https://www.arb.ca.gov/app/emsmv/fcemssumcat/fcemssumcat2016.php>

<sup>26</sup> US Forest Service BlueSky Inventory <https://www.fs.usda.gov/pnw/tools/bluesky-framework>

<sup>27</sup> Fernandes and Botelho, 2003.

<sup>28</sup> Berger et al, 2018.

period, results in approximately 5 days of wildfire-related exceedances per year outside of the current wintertime spare the air alert period. Using the calculated emissions reduction of 3.5 tons per day, if a Mandatory Burn Ban were to be called for each of these 5 days per year, PM<sub>2.5</sub> emissions between the months of March through October would be reduced by approximately 17.5 tons annually.<sup>29</sup>

## **VI. ECONOMIC IMPACTS**

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

### **A. Cost Effectiveness and Incremental Cost Effectiveness**

Section 40920.6 of the California Health and Safety Code requires an air district to perform an incremental cost analysis for a proposed rule, if the purpose of the rule is to meet the requirement for best available retrofit control technology or for a feasible measure. The proposed amendments are not best available retrofit control technology requirements, nor are they a feasible measure required under the California Clean Air Act; therefore, an incremental cost analysis is not required.

### **B. 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, Berkeley, California has conducted a separate socioeconomic study/analysis of the proposed amendments to Reg 5 and Rule 6-3. The analysis of Reg 5 concluded that there are no expected socioeconomic impacts associated with the proposed amendments. The analysis of the proposed amendments to Rule 6-3 concluded that the changes are not expected to impact households or other users affected by the ban and does not have the potential for significant impacts on businesses. The full analysis reports are included as Appendix A.

### **C. District Impacts**

This section discusses the impacts to the Air District associated with the proposed amendments.

#### **Regulation 5**

The Air District does not anticipate the proposed public agency fee exemption to significantly impact program revenue; it is intended to complement statewide efforts to remove potential cost barriers associated with prescribed burning for wildfire prevention.

An increase in prescribed burning may result in an increased workload for staff in the Compliance and Enforcement and Meteorology and Measurements Divisions. This may include reviewing more smoke management plans and providing additional forecasting services. Air District staff are reviewing current policies and procedures to identify opportunities to streamline the Prescribed Burning Program, including integrating the Program into PFIRS.

---

<sup>29</sup> Bay Area Air Quality Management District, 2019

The Air District does not intend to hire additional staff to implement the proposed amendments to Reg 5.

### **Rule 6-3**

The Air District anticipates increased outreach efforts to educate the public on the proposed changes to the Rule 6-3 and the corresponding Spare the Air program. As for the day-to-day program, current program staff can implement the proposed changes. The Air District does not intend to hire additional staff to implement the proposed amendments to Rule 6-3.

## **VII. REGULATORY IMPACTS**

Section 40727.2 of the California 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.

## **VIII. ENVIRONMENTAL IMPACTS**

The California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq., and the CEQA Guidelines, 14 CCR 15000 et seq., require a government agency that undertakes or approves a discretionary project to consider the potential impacts of that project on all environmental media. Certain types of agency actions are, however, exempt from CEQA requirements.

The proposed amendments to Reg 5 are necessary to prevent or mitigate wildfire-related public health and natural resource emergencies, and consist of the modification of public agency operating expense fees; thus, the amendments to Reg 5 are exempt from the provisions of CEQA pursuant to Public Resources Code section 21080(b)(4) (Specific actions necessary to prevent or mitigate an emergency [are exempt from CEQA]), and Public Resources Code section 21080(b)(8) (CEQA does not apply to “[t]he establishment, modification, structuring, restructuring, or approval of rates, tolls, fares, or other charges by public agencies”).

Likewise, because the amendments to Rule 6-3 are necessary to prevent or mitigate a public health emergency during wildfire events, the amendments to Rule 6-3 are also exempt from the provisions of CEQA pursuant to Public Resources Code section 21080(b)(4). The amendments to both Rules are also exempt from CEQA pursuant to CEQA Guidelines sections 15307 (action to assure the maintenance, restoration, or enhancement of a natural resource), 15308 (action to assure the maintenance, restoration, enhancement, or protection of the environment) and 15061(b)(3) (no possibility that the activity in question may have a significant effect on the environment).

In addition, and in the alternative, potential environmental impacts from banning wood burning during forecasted high particulate matter days was analyzed by the Air District when it first adopted Rule 6-3 on July 9, 2008 and certified a Final Environmental Impact Report (herein “EIR”) on that date. The Air District incorporates the EIR into the record, which found that the banning of wood burning on high particulate matter days would have considerable environmental benefits. These include a reduction of peak concentrations of PM<sub>2.5</sub>, as well as a reduction in ozone-forming volatile

organic compounds, oxides of nitrogen, carbon monoxide, sulfur dioxide, and non-criteria pollutants, including toxic and carcinogenic compounds. The analysis also found that an increase in greenhouse gas emissions was not anticipated. No subsequent or supplemental EIR is required as there have not been substantial changes in the proposed project that would require major revisions to the EIR, there have not be substantial changes with respect to the circumstances under which the project is being undertaken that would require major revisions to the EIR, and there is no new information available that would change the analysis in the EIR. The analysis found that there would be no significant adverse environmental impacts from banning wood burning on days for which particulate matter is forecast to exceed the NAAQS. The 2008 Rule 6-3 adoption only banned wood burning if such forecasted particulate matter events occurred during wintertime, and the current proposed amendments will ban wood burning year-round during such forecasted events. However, the environmental impacts of banning wood remain the same or less significant under the current proposed Rule 6-3, as the Air District would expect more burning for ambiance rather than heat if wildfire events occur in warmer months and this burning would not be replaced by the burning of natural gas but cancelled altogether, reducing potential environmental impacts even further.

The Air District continues to believe both sets of amendments are exempt from CEQA. In the alternative, for the Rule 6-3 amendments, the Air District has also considered the EIR's findings that banning wood burning will not result in any significant adverse environmental impacts and will continue to rely on the EIR. The Air District plans to file a Notice of Exemption / Determination.

## **IX. RULE DEVELOPMENT / PUBLIC PARTICIPATION PROCESS**

This rule amendment process included extensive outreach to ensure as many stakeholders as possible were involved in the development of this proposal. Outreach was made to the Bay Area Prescribed Fire Council, local units of CAL FIRE, local fire agencies, private and public land managers, Rule 6-3 stakeholders, and any interested members of the general public.

On June 25, 2019, the Air District issued a notice for a public workshop to discuss initial drafts of amendments to Reg 5: Open Burning and Rule 6-3: Wood-Burning Devices with interested parties. This notice was distributed to the Air District's Community Engagement stakeholders list, Rule Development stakeholder list, Prescribed Burners stakeholders list, Reg 5 Open Burners stakeholder list, and Rule 6-3 stakeholders list. On July 11, 2019, the Air District issued a news release to inform the media about the scheduled workshop. On July 24, 2019, a public workshop and simultaneous webcast was held to solicit comments from the public on the initial proposal.

The Air District published draft rule language for both rules and a workshop report on July 1, 2019, and those documents were available for an interim public comment period from July 1 - August 12, 2019. Public comments received were considered and appropriate changes were incorporated into the proposed rules and this staff report. The following is a summary of the public comments received during the interim public comment period:

- Concern with any increase in open burning in the Bay Area.
- Support for exempting Reg 5 fees for public agencies conducting prescribed burning.
- Confusion regarding and interest in streamlining the smoke management plan review process for prescribed burning.
- General questions about the current Reg 5 and Prescribed Burning Program procedures.

- Overall support for strengthening Rule 6-3 to protect public health.

The Air District published a Hearing Package on the Air District website on September 23, 2019, and those documents were available for a 30-day public comment period from September 23 - October 23, 2019. The proposed amendments are scheduled to be presented to the Air District Board of Directors for consideration on November 20, 2019.

## X. 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 Air District has determined that the proposed rule amendments are:

- Necessary to protect public health by reducing particulate matter emissions to mitigate public health emergencies and assist in achieving state and federal ambient air quality standards for particulate matter and to remove potential cost barriers to prescribed burning for wildfire prevention in accordance with Executive Order N-05-19 and the March 22, 2019 Proclamation of a State of Emergency for California and CAL FIRE's recommendation that local air quality regulators encourage prescribed burning in *The Community Wildfire Prevention and Mitigation Report*, February 2019;
- Authorized by California Health and Safety Code Sections 40000, 40001, 40702, and 40725 through 40728;
- Clear, in that the new regulations specifically delineate the affected industry and persons, compliance options, and administrative requirements for industry and persons subject to the rules, so that their meaning can be easily understood by the persons directly affected by them;
- Consistent with other Air 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.

The proposed rule amendments have met all legal noticing requirements, have been discussed with the regulated community, and reflect consideration of the input and comments of affected and interested parties. Air District staff recommends adoption of the proposed amendments to Regulation 5 and Regulation 6, Rule 3.

## XI. REFERENCES

Bay Area Air Quality Management District. 2019. *Regulation 3: Fees (Effective July 1, 2019)*. [http://www.baaqmd.gov/~media/dotgov/files/rules/archive-2019-regulation-3/documents/20190605\\_fr\\_0300\\_2019-pdf.pdf?la=en](http://www.baaqmd.gov/~media/dotgov/files/rules/archive-2019-regulation-3/documents/20190605_fr_0300_2019-pdf.pdf?la=en).

Bay Area Air Quality Management District. 2013. *Regulation 5: Open Burning*. <http://www.baaqmd.gov/~media/dotgov/files/rules/reg-5-open-burning/documents/rg0500.pdf?la=en>.

Bay Area Air Quality Management District. 2008. *Proposed New Regulation 6: Particulate Matter, Rule 3: Wood-burning Devices, Amendments to Regulation 1: General Provisions and Definitions, and Regulation 5: Open Burning Staff Report*. [http://www.baaqmd.gov/~media/files/planning-and-research/public-hearings/2008/reg-6-rule-3/0603\\_stfrpt\\_060408.pdf](http://www.baaqmd.gov/~media/files/planning-and-research/public-hearings/2008/reg-6-rule-3/0603_stfrpt_060408.pdf).



Bay Area Air Quality Management District. 2019. Compliance and Enforcement Division's *Policy and Procedures Open Burning Regulation 5*.

[http://www.baaqmd.gov/~media/Files/Compliance%20and%20Enforcement/Policies%20and%20Procedures/reg5\\_guidelines\\_102003.ashx?la=en](http://www.baaqmd.gov/~media/Files/Compliance%20and%20Enforcement/Policies%20and%20Procedures/reg5_guidelines_102003.ashx?la=en)

Bay Area Air Quality Management District. 2012. *Understanding Particulate Matter: Protecting Public Health in the San Francisco Bay Area*. [http://www.baaqmd.gov/~media/files/planning-and-research/plans/pm-planning/understandingpm\\_draft\\_aug-23.pdf](http://www.baaqmd.gov/~media/files/planning-and-research/plans/pm-planning/understandingpm_draft_aug-23.pdf).

Berger, C., S. Fitzgerald, D. Leavell, and J. Peterson. 2018. *Fire FAQs: Air quality impacts from prescribed fire and wildfire: How do they compare?* Oregon State University Extension Service. <https://catalog.extension.oregonstate.edu/em9203/html>.

Bølling, Anette Kocback, Joakim Pagels, Karl Espen Yrri, Lars Barregard, Gerd Sallsten, Per E Schwarze and Christoffer Boman. 2009. *Health effects of residential wood smoke particles: the importance of combustion conditions and physicochemical particle properties*. *Particle and Fibre Toxicology* 6: 29.

California Air Resources Board. Draft January 2019. *California 2030 Natural and Working Lands Climate Change Implementation Plan*. <https://ww3.arb.ca.gov/cc/natandworkinglands/draft-nwl-ip-1.3.19.pdf>.

California Air Resources Board. California Emissions Projection Analysis Model 2016. <https://www.arb.ca.gov/app/emsinv/fcemsumcat/fcemsumcat2016.php>.

California Department of Forestry and Fire Protection. 2019. *Camp Fire Incident Report*.

California Department of Forestry and Fire Protection. 2019. *Community Wildfire Prevention and Mitigation Report*. <https://www.fire.ca.gov/media/5584/45-day-report-final.pdf>.

California, Executive Department [Edmund Brown Jr.]. Executive Order B-52-18. 10 May 2018. <https://fmtf.fire.ca.gov/media/1859/51018-forest-eo.pdf>.

California, Executive Department [Gavin Newsom]. Executive Order N-05-19. 8 January 2019. <https://www.gov.ca.gov/wp-content/uploads/2019/01/1.8.19-EO-N-05-19.pdf>.

California, Executive Department [Gavin Newsom]. Proclamation of a State of Emergency. 22 March 2019. <https://www.gov.ca.gov/wp-content/uploads/2019/03/03.22.19-State-of-Emergency-Attested.pdf>.

Fernandes, Paulo M. and Herminio S. Botelho. 2003. *A review of prescribed burning effectiveness in fire hazard reduction*. *Journal of Wildland Fire* 12: 117-128.

Flannigan, M.D., B.J. Stocks, and B.M. Wonton. 2000. *Climate change and forest fires*. *Science of the Total Environment* 262 (December): 221-229.

Khadka, Navin Singh. "Climate change: Worries over CO2 emissions from intensifying wildfires," *BBC World Service*, November 15, 2018, World Service, Science & Environment. <https://www.bbc.com/news/science-environment-46212844>.

United States Environmental Protection Agency. 2016. *Wildfire Smoke: A Guide for Public Health Officials*. [https://www3.epa.gov/airnow/wildfire\\_may2016.pdf](https://www3.epa.gov/airnow/wildfire_may2016.pdf).

United States Forest Service. BlueSky Inventory. <https://www.fs.usda.gov/pnw/tools/bluesky-framework>.

Westerling, Anthony Leroy. 2016. *Increasing western US forest wildfire activity: sensitivity to changes in the timing of spring*. Philosophical Transactions of the Royal Society B 371: 20150178.

Williams, A. P., Abatzoglou, J. T., Gershunov, A., Guzman-Morales, J., Bishop, D. A., Balch, J. K., & Lettenmaier, D. P. 2019. *Observed impacts of anthropogenic climate change on wildfire in California*. Earth's Future, 7, 892–910. <https://doi.org/10.1029/2019EF001210>.

## **XII. APPENDICES**

### **A. Comments and Responses**

### **B. Socioeconomic Analysis**

### **C. CEQA Analysis**

# Appendix A: Public Comments and Air District Responses

## Regulation 5: Open Burning

Comment 1: *Given that the BAAQMD is considering amendments to Regulation 5 that intends to complement statewide efforts to reduce catastrophic wildfire risk, it seems out of sync with PRC 4475 if BAAQMD continues to charge non-public agencies open burning fees, while waiving them for public agencies.*

*Prometheus Fire Consulting Services*

Response 1: Public Resource Code (PRC) 4475 pertains to agreements made with CAL FIRE for prescribed burning. The fee exemption would apply when a public agency conducts prescribed burning for wildfire prevention on land owned by a private entity or non-profit organization as long as there is a cooperative agreement or contract between the public agency and landowner.

Comment 2: Letter of Support for exempting public agencies from paying open burning fees.

*County of Santa Clara Department of Parks and Recreation*

Response 2: The Air District notes and appreciates the County of Santa Clara Department of Parks and Recreation's support of the proposed amendments.

Comment 3: *Prescribed burning and training exercises, such as CA-219, to train prescribed burn and fire personnel the skills required for prescribed burning should be exempted from fees. The fuels build up in CA presents a great threat to life and property and air quality. The objectives of prescribed burns and training exercises are to reduce fuels are a net savings to CA air quality. Yet CA does not have enough funding to conduct enough prescribed burning and training needed to reduce all fuel loadings. The waiving or reduction in permit fees will assist in these endeavors.*

*Emergency Management Consultants, LLC*

Response 3: The Air District notes and appreciates the commenter's support of the proposed amendments generally. If training exercises are conducted as part of prescribed burns, they would be exempt from fees under the current proposed amendments. The Air District will consider expanding the exemption to cover additional training exercises in future amendments to the Regulation, but such a change is outside of the scope of the current proposed amendments.

Comment 4: Letter of Support for the proposed amendments.

*San Mateo County Parks Department*

Response 4: The Air District notes and appreciates the San Mateo County Parks Department's support of the proposed amendments.

Comment 5: *The Coalition for Clean Air is concerned with any Open Burning, because of its associated harmful air pollutants, especially PM<sub>2.5</sub>. To address our concern with BAAQMD's*

*proposed amendments to Regulation 5: Open Burning, we request that the District look for reasonable solutions, including incentives to reuse materials planned for Open Burning. Specifically, we recommend that options which would reuse instead of burning designated contents of targeted acreage be developed. With proper planning, such options could include reuse of collected compost, wood, etc., if proven to be reasonable and cost effective. As we heard at the July 24, 2019 workshop from other comments, even though the clearing of such targeted acreage in lieu of burning could cost several thousands of dollars per acre, such costs may be able to be reasonably subsidized by an existing air pollution funding mechanism or other programs.*

*Coalition for Clean Air*

Response 5: The Air District's proposed amendments support statewide efforts to prevent larger, more destructive wildfires through increased prescribed burning. The Air District currently offers alternatives to open burning through its Agricultural Waste Chipping Program to help reduce emissions from agricultural operations. The Agricultural Waste Chipping Program offers incentives to chip agricultural waste that would otherwise be burned. The chipped material is then available for reuse.

Comment 6: *Letter of Support for the proposed amendments.*

*Midpeninsula Regional Open Space District*

Response 6: The Air District notes and appreciates the Midpeninsula Regional Open Space District's support of the proposed amendments.

### **Rule 6-3: Wood-Burning Devices**

Comment 7: *Support of year-round protection from unhealthy air.*

*Resident*

Response 7: The Air District notes and appreciates the commenter's support of the proposed amendments.

Comment 8: *The Coalition for Clean Air supports BAAQMD's latest amendments to extend the banning of designated wood burning during Spare the Air Alerts year-round. However, BAAQMD still allows common uncontrolled wood burning during most days in a year.*

*We continue to recommend that BAAQMD adopt its original March 2015 proposal regarding Sale or Transfer of Real Property requiring the decommissioning of an uncertified wood burning device or replacement with appropriate equipment to lower Fine Particulates (PM<sub>2.5</sub>) emissions. This measure is needed because of the frequent and harmful exposure of wood burning toxic pollutants to Bay Area residents on any allowed wood burning day.*

*Coalition for Clean Air*

Response 8: The Air District notes and appreciates the Coalition for Clean Air's support of the current proposed amendments specifically aimed to address the unprecedented increase in devastating wildfires over the last few years. The Air District also appreciates the Coalition's

support of the 2015 proposal, "Sale or Transfer of Real Property," to require the replacement of uncertified wood-burning devices at the time of property sale, resale, or transfer. The Air District recognizes the need to continue to transition the Bay Area to cleaner heating devices to further reduce regional and local fine particulate emissions and may consider the "Sale or Transfer of Real Property" proposal in future rulemaking efforts.

bae urban economics

**Socio-Economic Impact Study of Proposed Amendments  
to Regulation 5: Open Burning**

Submitted to: Bay Area Air Quality Management District  
September 9, 2019

# bae urban economics

## Table of Contents

EXECUTIVE SUMMARY .....	1
Description of Proposed Rule.....	1
Affected Industries .....	2
Socio-Economic Impacts.....	2
DESCRIPTION OF PROPOSED RULE AMENDMENT .....	3
REGIONAL TRENDS .....	6
Regional Demographic Trends .....	6
Regional Economic Trends .....	7
AFFECTED INDUSTRIES.....	9
SOCIO-ECONOMIC IMPACTS .....	9

## List of Tables

Table 1: Total Fees & Submitted Plans for Prescribed Burns by Public Agencies, 2013-2018 .	5
Table 2: Population and Household Trends, 2000-2019 .....	6
Table 3: Jobs by Sector, 2013-2018 (a) .....	8

### San Francisco

2600 10<sup>th</sup> St., Suite 300  
Berkeley, CA 94710  
510.547.9380

### Sacramento

803 2<sup>nd</sup> St., Suite A  
Davis, CA 95616  
530.750.2195

### Los Angeles

448 South Hill St., Suite 701  
Los Angeles, CA 90013  
213.471.2666

### Washington DC

700 Pennsylvania Ave. SE, 2<sup>nd</sup> Floor  
Washington, DC 20003  
202.588.8945

### New York City

234 5<sup>th</sup> Ave.  
New York, NY 10001  
212.683.4486

## EXECUTIVE SUMMARY

### Description of Proposed Rule

Wildfire smoke presents immediate impacts to local air quality and public health, and atmospheric conditions can quickly transport smoke great distances, with even distant fires affecting the air quality throughout the Bay Area. The fires in Napa and Sonoma County in 2017 and in Butte County in 2018 generated unprecedented levels of particulate matter, which reached hazardous levels never before experienced in the Bay Area.

The Bay Area Air Quality Management District (“Air District” or “BAAQMD”) proposes to amend Regulation 5 to help reduce potential cost barriers associated with open burning fees to align with statewide efforts to prevent larger, more destructive wildfires through increased prescribed burning. The draft Regulation 5 amendments would:

- Exempt public agencies from paying Open Burning Operation Fees when conducting prescribed burns for the purpose of wildfire prevention (Regulation 5, Section 113).
- Clarify the administrative requirement for Open Burning Operation Fees (Regulation 5, Section 411).

Prescribed burning is a way to reduce the potential for larger, more destructive wildfires, prevent harmful wildfire smoke impacts, and maintain healthy forest ecosystems. The Air District proposes to amend Regulation 5 to eliminate fees to public agencies that conduct prescribed burning for wildfire prevention for the benefit of the public and environment. Currently, the Wildland Vegetation Management fire type is defined in Regulation 5, Section 401.15 as “prescribed burning by a state or federal agency or through a cooperative agreement involving the state or federal agency.” The Air District proposes to replace “state or federal” agency with “public” agency to be consistent with the draft limited exemption for public agencies (Regulation 5, Section 113). Other changes in Regulation 5 are limited to administrative clarifications (e.g., fee must be paid before the proposed burn activity) and replacement text (e.g., “Curtailed Period” replaced by “Mandatory Burn Ban”) and thus are not material changes that could potentially lead to socioeconomic impacts. The Air District does not anticipate this fee exemption to significantly impact program revenue; it is intended to complement statewide efforts to remove potential cost barriers associated with prescribed burning for wildfire prevention.



## **Affected Industries**

The direct impacts of the proposed amendments to Regulation 5 will fall on public agencies, and take the form of reduced fees, resulting in minor cost savings for those agencies and minor decreases in revenues for the Air District. The total cost of the 45 permits issued from 2013 through 2018 was only \$20,772, or approximately \$460 per permit, a negligible amount. Furthermore, the fees to be eliminated represent a minor benefit for the applicant agencies, rather than a cost. The amendment also has no impact on the private sector. As a result there are no expected socioeconomic impacts associated with the proposed rule change in either the private or public industry sectors.

## **Socio-Economic Impacts**

As noted above, aside from administrative changes, the amendment primarily entails reduced fees for public agencies applying for permits for prescribed burns. There are no costs to these agencies associated with the rule change, and the decrease in revenues to the Air District is negligible. Thus there are no expected socioeconomic impacts associated with the amendments to Regulation 5.

## ***Small Business Impacts***

According to California Government Code 14835, a small business is any business that meets the following requirements:

- Must be independently owned and operated;
- Cannot be dominant in its field of operation;
- Must have its principal office located in California;
- Must have its owners (or officers in the case of a corporation) domiciled in California; and
- Together with its affiliates, be either:
  - A business with 100 or fewer employees, and an average annual gross receipts of \$10 million or less over the previous three tax years, or
  - A manufacturer with 100 or fewer employees.

None of the impacts are related to private businesses, thus there is no expected potential for significant impacts for any small business.

## DESCRIPTION OF PROPOSED RULE AMENDMENT

Over the last several years, California has experienced some of the deadliest and most destructive wildfires in its history, with wildfire events becoming the “new normal.”<sup>1</sup> As a result, new wildfire prevention initiatives and actions are needed. Climate change is causing higher temperatures and longer dry periods, as well as lengthening the fire season and increasing the risk of wildfires. In addition to destroying entire communities and burning everything in their path, wildfires generate a mixture of fine particulate matter and hazardous chemicals and compounds in the air.

Wildfire smoke presents immediate impacts to local air quality and public health, and atmospheric conditions can quickly transport smoke great distances, with even distant fires affecting the air quality throughout the Bay Area. The fires in Napa and Sonoma County in 2017 and in Butte County in 2018 generated unprecedented levels of particulate matter, which reached hazardous levels never before experienced in the Bay Area.

As a result, the Bay Area Air Quality Management District (“Air District” or “BAAQMD”) proposes to amend Regulation 5 to help reduce potential cost barriers associated with open burning fees to align with statewide efforts to prevent larger, more destructive wildfires through increased prescribed burning. The draft Regulation 5 amendments would:

- Exempt public agencies from paying Open Burning Operation Fees when conducting prescribed burns for the purpose of wildfire prevention (Regulation 5, Section 113).
- Clarify the administrative requirement for Open Burning Operation Fees (Regulation 5, Section 411).

Currently, Air District Regulation 5 prohibits open burning with the exception of 17 types of fires that are conditionally allowed on designated permissive burn days when meteorological conditions are favorable for dispersion. One allowable fire type is “prescribed burning,” which is the planned, controlled application of fire to vegetation to achieve specific natural resource management objectives, including wildfire prevention, and ensure fire safety. Prescribed burns are designed to burn less intensely than wildfires and are lit amid controlled conditions to minimize potential smoke impacts.

---

<sup>1</sup> This rule description borrows much of its text from the “Reg 5 and Rule 6-3 Workshop Report” from July 2019.

Wildfire events are more likely to result in harmful air quality and public health impacts than prescribed burning because wildfires are unplanned and typically larger compared to prescribed burns. Wildfires tend to last longer and burn more vegetation per acre than prescribed burns. Due to historical fire suppression efforts, many forests in California contain excess amounts of vegetation that serve as fuel and, as a result, are highly susceptible to catastrophic wildfires. Prescribed burning is a way to reduce the potential for larger, more destructive wildfires, prevent harmful wildfire smoke impacts, and maintain healthy forest ecosystems.

Due to these statewide efforts to prevent wildfires, fuel reduction projects are expected to sharply increase throughout the next few years and beyond. While it is uncertain how many additional prescribed burns by public agencies the Air District will review, the Air District intends to support wildfire prevention measures taken to reduce fuels to prevent larger, more catastrophic wildfires that can create public health emergencies. The Air District proposes to amend Regulation 5 to eliminate fees to public agencies that conduct prescribed burning for wildfire prevention for the benefit of the public and environment. Currently, the Wildland Vegetation Management fire type is defined in Regulation 5, Section 401.15 as “prescribed burning by a state or federal agency or through a cooperative agreement involving the state or federal agency.” The Air District proposes to replace “state or federal” agency with “public” agency to be consistent with the draft limited exemption for public agencies (Regulation 5, Section 113). Other changes in Regulation 5 are limited to administrative clarifications (e.g., fee must be paid before the proposed burn activity) and replacement text (e.g., “Curtailed Period” replaced by “Mandatory Burn Ban”) and thus are not material changes that could potentially lead to socioeconomic impacts.

The draft amendments to Regulation 5 would remove potential cost barriers for public agencies conducting a prescribed burn for wildfire prevention purposes. The draft amendment is intended to complement statewide efforts by removing potential barriers to prescribed burning conducted for wildfire prevention purposes. The draft amendment would exempt a public agency from having to pay an Open Burning Operation Fee,<sup>2</sup> as currently required by Regulation 5, Section 411

---

<sup>2</sup> As of July 1, 2019, the fee is \$602 for a proposed Wildland Vegetation Management Fire project less than or equal to 50 acres; \$816 for a proposed project 50 acres to 150 acres; and \$1,062 for a proposed project greater than 150 acres.

Since the fee schedule went into effect in July 2013, the Air District has collected approximately \$20,772 in Wildland Vegetation Management Fire fees from 45 prescribed burn applications submitted by public agencies

---

**Table 1: Total Fees & Submitted Plans for Prescribed Burns by Public Agencies, 2013-2018**

---

	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>Total</u>
<b>Fees Paid</b>	\$3,400	\$4,075	\$2,214	\$3,925	\$3,463	\$3,695	\$20,772
<b>Plans Submitted</b>	5	9	9	6	8	8	45

---

Note: Fee was introduced in 2013.

Source: BAAQMD, 2019.

The Air District does not anticipate this fee exemption to significantly impact program revenue; it is intended to complement statewide efforts to remove potential cost barriers associated with prescribed burning for wildfire prevention.

## REGIONAL TRENDS

This section provides background information on the demographic and economic trends for the nine-county San Francisco Bay Area, which represents the Air District’s jurisdiction.<sup>3</sup> Regional trends are compared to statewide demographic and economic patterns since 2000, in order to show the region’s unique characteristics relative to the State and to provide context for the impact analysis.

### Regional Demographic Trends

Table 2 shows the population and household trends for the nine-county Bay Area and California between 2000 and 2019. During this time, the Bay Area’s population increased by 14.7 percent, compared to 17.9 percent for California as a whole. Similarly, the number of Bay Area households grew by 10.4 percent, compared to 13.8 percent growth statewide, as average household size increased in both geographies.

**Table 2: Population and Household Trends, 2000-2019**

<b>Bay Area (a)</b>	<b>2000</b>	<b>2019</b>	<b>Total Change 2000-2019</b>	<b>% Change 2000-2019</b>
<b>Population</b>	6,784,348	7,783,460	999,112	14.7%
<b>Households</b>	2,466,020	2,723,550	257,530	10.4%
<b>Average Household Size</b>	2.69	2.80		
<b>California</b>				
<b>Population</b>	33,873,086	39,927,315	6,054,229	17.9%
<b>Households</b>	11,502,871	13,085,036	1,582,165	13.8%
<b>Average Household Size</b>	2.87	2.99		

Notes:

(a) Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

Sources: California State Department of Finance, 2019; US Census, 2000; BAE 2019.

The Bay Area’s slower growth is tied to its relatively built-out environment, compared to the state overall. While Central Valley locations, such as the Sacramento region, experienced large increases in the number of housing units, the Bay Area experienced more moderate

<sup>3</sup> The Air District’s jurisdiction consists of nine counties, including all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, as well as the western portion of Solano County and the southern portion of Sonoma County. See <http://www.arb.ca.gov/app/dislookup/dislookup.php>

increases in housing units. Nevertheless, the region has still gained almost one million residents since 2000.

## **Regional Economic Trends**

Table 3 shows jobs by sector in 2013 and 2018 for the Bay Area and California. In the five-year period between 2013 and 2018, the Bay Area's employment base grew by 16.2 percent, increasing from 3.44 million jobs to almost 4.00 million jobs, as the economy has shown strong growth. Statewide employment only increased by 13.1 percent from 15.56 million jobs in 2013 to 17.60 million jobs in 2018. The rate of job growth for both the Bay Area and the State over the five-year period was far higher than the rate of population growth, another indicator of the strong recovery from recession.

The largest major economic sectors in the Bay Area economy are Professional & Business Services, Educational & Health Services, Government, and Leisure & Hospitality. Each of these sectors accounted for over 10 percent of all wage and salary employment in the region. Overall, the Bay Area's economic base largely resembles the state's base, sharing a similar distribution of employment across sectors. One noteworthy variation is the higher Bay Area employment in the Professional, Scientific, & Technical Services sector, which makes up 19.3 percent of employment in the Bay Area compared to only 15.1 percent statewide.

All major industry sectors showed an increase in employment in the Bay Area between 2013 and 2018, with increases of greater than 20 percent in Information; Mining, Logging, and Construction; and Transportation, Warehousing, and Utilities. The growth of over 50 percent in Information is especially noteworthy, indicating the continuing importance of the technology economy in the region. Statewide, the same three major sectors showed employment growth of more than 20 percent, but the growth in Information jobs was only 21 percent.

**Table 3: Jobs by Sector, 2013-2018 (a)**

Industry Sector	Bay Area					California				
	2013 (b)		2018 (c)		% Change 2013-2018	2013 (b)		2018 (c)		% Change 2013-2018
	Jobs	% Total	Jobs	% Total		Jobs	% Total	Jobs	% Total	
Agriculture	19,900	0.6%	20,100	0.5%	1.0%	412,400	2.6%	424,200	2.4%	2.9%
Mining, Logging, and Construction	152,400	4.4%	205,400	5.1%	34.8%	666,000	4.3%	882,400	5.0%	32.5%
Manufacturing	313,800	9.1%	362,700	9.1%	15.6%	1,262,500	8.1%	1,325,400	7.5%	5.0%
Wholesale Trade	119,600	3.5%	122,900	3.1%	2.8%	671,300	4.3%	698,900	4.0%	4.1%
Retail Trade	328,100	9.5%	346,000	8.7%	5.5%	1,593,900	10.2%	1,688,600	9.6%	5.9%
Transportation, Warehousing, and Utilities	90,000	2.6%	116,700	2.9%	29.7%	503,800	3.2%	664,000	3.8%	31.8%
Information	138,400	4.0%	211,500	5.3%	52.8%	449,800	2.9%	543,700	3.1%	20.9%
Financial Activities	177,200	5.2%	194,500	4.9%	9.8%	781,200	5.0%	836,300	4.8%	7.1%
Professional & Business Services	645,500	18.8%	771,500	19.3%	19.5%	2,349,200	15.1%	2,663,700	15.1%	13.4%
Educational & Health Services	516,700	15.0%	599,500	15.0%	16.0%	2,309,000	14.8%	2,726,500	15.5%	18.1%
Leisure & Hospitality	371,500	10.8%	432,100	10.8%	16.3%	1,674,800	10.8%	1,986,100	11.3%	18.6%
Other Services, except Public Administration	117,400	3.4%	129,900	3.3%	10.6%	515,500	3.3%	572,100	3.3%	11.0%
Government (d)	449,500	13.1%	483,000	12.1%	7.5%	2,374,300	15.3%	2,587,400	14.7%	9.0%
<b>Total, All Employment (e)</b>	<b>3,440,000</b>	<b>100.0%</b>	<b>3,995,800</b>	<b>100.0%</b>	<b>16.2%</b>	<b>15,563,700</b>	<b>100.0%</b>	<b>17,599,400</b>	<b>100.0%</b>	<b>13.1%</b>
<b>Population</b>	<b>7,417,430</b>		<b>7,751,650</b>		<b>4.5%</b>	<b>38,321,459</b>		<b>39,740,508</b>		<b>3.7%</b>

## Notes:

(a) Includes all wage and salary employment.

(b) Represents annual average employment for calendar year 2013.

(c) Represents annual average employment for calendar year 2018.

(d) Government employment includes workers in all local, state and Federal workers, not just those in public administration. For example, all public school staff is in the Government category.

(e) Totals may not sum from parts due to independent rounding.

Sources: California Employment Development Department, 2019; CA Department of Finance, 2019; BAE, 2019.

## AFFECTED INDUSTRIES

The direct impacts of the proposed amendments to Regulation 5 will fall on public agencies, and take the form of reduced fees, resulting in minor cost savings for those agencies and minor decreases in revenues for the Air District. The total cost of 45 permits issued from 2013 through 2018 was only \$20,772, or approximately \$460 per permit, a negligible amount. Furthermore, the fees to be eliminated represent a minor benefit for the applicant agencies, rather than a cost. The amendment also has no impact on the private sector. As a result there are no expected socioeconomic impacts associated with the proposed rule change in either the private or public industry sectors.

## SOCIO-ECONOMIC IMPACTS

As noted above, aside from administrative changes, the amendment primarily entails reduced fees for public agencies applying for permits for prescribed burns. There are no costs to these agencies associated with the rule change, and the decrease in revenues to the Air District is negligible. Thus there are no expected socioeconomic impacts associated with the amendments to Regulation 5.

### ***Small Business Impacts***

According to California Government Code 14835, a small business is any business that meets the following requirements:

- Must be independently owned and operated;
- Cannot be dominant in its field of operation;
- Must have its principal office located in California;
- Must have its owners (or officers in the case of a corporation) domiciled in California; and
- Together with its affiliates, be either:
  - A business with 100 or fewer employees, and an average annual gross receipts of \$10 million or less over the previous three tax years, or
  - A manufacturer with 100 or fewer employees.

None of the impacts are related to private businesses, thus there is no expected potential for significant impacts for any small business.



bae urban economics

**Socio-Economic Impact Study of Proposed Amendments  
to Regulation 6: Particulate Matter and Visible Emissions, Rule 3: Wood-Burning Devices**

Submitted to: Bay Area Air Quality Management District  
September 5, 2019

# bae urban economics

## Table of Contents

EXECUTIVE SUMMARY .....	1
Description of Proposed Rule.....	1
Socio-Economic Impacts.....	1
DESCRIPTION OF PROPOSED RULE AMENDMENT .....	6
REGIONAL TRENDS .....	7
Regional Demographic Trends.....	7
Regional Economic Trends .....	8
AFFECTED INDUSTRIES.....	10
SOCIO-ECONOMIC IMPACTS .....	10
Impacts on Firewood Dealers.....	10

### San Francisco

2600 10<sup>th</sup> St., Suite 300  
Berkeley, CA 94710  
510.547.9380

### Sacramento

803 2<sup>nd</sup> St., Suite A  
Davis, CA 95616  
530.750.2195

### Los Angeles

448 South Hill St., Suite 701  
Los Angeles, CA 90013  
213.471.2666

### Washington DC

700 Pennsylvania Ave. SE, 2<sup>nd</sup> Floor  
Washington, DC 20003  
202.588.8945

### New York City

234 5<sup>th</sup> Ave.  
New York, NY 10001  
212.683.4486

## List of Tables

Table 1: Population and Household Trends, 2000-2019 .....	7
Table 2: Jobs by Sector, 2013-2018 (a) .....	9
Table 3: Profile of Other Fuel Dealers Industry .....	11
Table 4: Firewood Dealers in the Bay Area .....	12
Table 5: Major Sellers of Wood for Fuel, United States .....	12
Table 6: Returns on Total Receipts for Nonstore Retailers, 2005-2014, for Active Corporations .....	13
Table 7: Bay Area PM2.5 Exceedances 2015-2019 .....	14
Table 8: High and Low Temperatures for San Francisco and Livermore ( °F) .....	15

## EXECUTIVE SUMMARY

### Description of Proposed Rule

Wildfire smoke presents immediate impacts to local air quality and public health, and atmospheric conditions can quickly transport smoke great distances, with even distant fires affecting the air quality throughout the Bay Area. The fires in Napa and Sonoma County in 2017 and in Butte County in 2018 generated unprecedented levels of particulate matter, including hazardous levels never before experienced in the Bay Area.

The Bay Area Air Quality Management District (“Air District” or “BAAQMD”) proposes to amend Regulation 6, Rule 3 (Rule 6-3) to further protect public health when wildfire smoke affects air quality in the Bay Area, since the current rule limits the Air District’s ability to ban wood burning only during the wintertime November through February period. The proposed 6-3 amendments would extend the Air District’s authority to announce a Spare the Air Alert and ban wood burning or combustion in wood-burning devices year-round whenever particulate matter is forecasted to exceed 35 micrograms per cubic meter (35µg/m<sup>3</sup>). The draft amendment will allow the Air District to ban wood burning any time unhealthy levels of particulate matter are forecasted, further protecting public health when wildfire smoke affects air quality in the Bay Area.

### Socio-Economic Impacts

#### *Affected Industries*

The direct impacts of the proposed amendments to Rule 6-3 will fall on households and others burning wood either as a heat source or for ambiance, rather than on particular industries. Since the direct impacts would result in reduced purchased of firewood, households would see an increase in dollars available for other expenditures rather than negative impacts. One small subsector that might be affected is Direct Selling Firewood Dealers (a subset of NAICS 454310, Fuel Dealers) who could see sales decline as consumption drops due to an increase in days with a Mandatory Burn Ban.

There are no direct compliance costs to consumers associated with the ban; it merely prohibits the burning of wood in stoves and fireplaces on certain days of the year. As a result the analysis here assumes no socio-economic impacts on households or other users affected by the ban, and no further analysis of impacts on households and others using firewood is

undertaken. The following analysis focuses solely on any potential loss of sales at firewood dealers.

### ***Impacts on Firewood Dealers***

As noted previously, firewood dealers may see direct impacts on sales due to possible limitations on the use of firewood on certain additional days of the year. The current rule already bans wood burning on certain days from November through February; impacts of the current ban are not considered here. However, as a result of possible restrictions on certain additional days, firewood dealers may face lower sales and reduced revenues.

### ***Economic Profile of Affected Industry***

Firewood dealers are part of the category defined in the North American Industry Classification System (NAICS) as “Fuel Dealers,” an industry comprising “establishments primarily engaged in retailing heating oil, liquefied petroleum (LP) gas, and other fuels via direct selling,” in NAICS category 454310. More specifically, the Economic Census provides some data specifically for “Other Fuel Dealers,” which are “establishments primarily engaged in retailing fuels, such as coal, wood, or other fuels (except liquefied petroleum gas and heating oil) via direct selling.”

There are a very small number of Bay Area establishments in the Other Fuel Dealers category. According to the 2012 Economic Census (most recent data available), there were only 22 establishments in this category in all of California, and only eight in the San Jose-San Francisco-Oakland Combined Statistical Area (CSA), which encompasses the Air District’s region. Based on the data available, the dealers in the state employed only 79 workers, and the CSA’s dealers employed a total of between 20 and 79 employees.

BAE also queried Dun & Bradstreet data and conducted online searches, and obtained a list of firewood dealers in the Bay Area. This research shows 14 dealers, with 60 employees and annual revenues estimated at approximately \$6.2 million. While this information varies somewhat from the Economic Census for a variety of reasons related to the source,<sup>1</sup> it confirms that there are a limited number of firewood dealers in the Bay Area, and that they have limited employment.

---

<sup>1</sup> For example, the Duns data may include businesses with no paid wage and salary employees (e.g., sole proprietorships), even though DUNS reports employees at each site. Also, the Economic Census data are from a different time frame, and the DUNS data cannot be confirmed via administrative records that the Census Bureau may have access to.

While firewood and other fuel dealers are not the only source for firewood, it is unlikely that decreased sales of firewood products at other retail outlets (e.g., supermarkets or hardware stores) would be substantial enough to impact business adversely. The 2012 Economic Census data indicate that firewood sales do not account for a significant portion of sales for other types of retailers. For example, firewood sales make up less than one percent of sales at gasoline stations that carry the product; for fuel dealers selling firewood, 22 percent of revenues come from sales of firewood.

#### *Estimated Rate of Return*

Firewood dealers are part of the larger category of nonstore retailers (NAICS 454), which is the most specific category available in the IRS data on net corporate income. For this analysis, 10-year averages were used as a benchmark such that the impacts of any particular year's performance due to economic fluctuations are lessened. For nonstore retail corporations as a group, the 10-year average net income as a percent of total receipts for nonstore retailers is 4.3 percent.

#### *Compliance Costs*

Firewood dealers do not have costs related to compliance with the amended Rule. The potentially significant losses are related to decreased business, not compliance costs. The decreased business would result from decreased wood burning on Mandatory Burn Ban days.

As indicated by data from recent years, the number of such burn ban days may vary considerably by year due to short-term weather changes, and may change long-term due to climate change. Additionally, some of the exceedance days occur within the existing ban period, and thus the proposed rule change would not result in any changes in impacts for those days. Over the 2015 through 2018 period, there were an average of 4.75 exceedance days per year due to wildfires outside the current ban period, but the variation has been considerable over the four years, ranging from zero days in 2016 to 14 days in 2017. So far in 2019, there have been no exceedance days.

Assuming that households and others consume firewood at an even rate throughout the year, and that in an average year they would be restricted from burning on 4.75 additional days, in an average year their firewood consumption would be reduced by only approximately 1.3 percent. Using the "worst case" year (14 additional days of banned wood-burning) as the benchmark, firewood consumption would decline by 3.8 percent over the year.

However, these "back of the envelope" estimates of lost sales do not take into account seasonal variations in demand. The expanded burn ban period would cover warmer seasons

where the need to burn wood for heating would be less than during the current November to February period. In fact, the summer fire season is often associated with unusually hot weather on days where wood-burning for heat would be unlikely. Many of the exceedance days from 2015 through 2018 were days of extreme heat in the Bay Area; on one of those days (September 1, 2017) San Francisco recorded its hottest temperature ever.

Further analysis indicates that for San Francisco, only one of the 19 additional exceedance days between 2015 and 2018 had temperatures below the annual average; for Livermore, only four additional exceedance days had temperatures below the annual average. This indicates that overall, firewood consumption for heating on the additional exceedance days would be below annual per day averages. Nevertheless, to be conservative, the estimate of sales loss here is assumed to range from 1.3 to 3.8 percent of annual revenues. It is assumed that the losses will be sustained by these types of businesses; households and businesses heating with wood as their primary fuel are unlikely to be purchasing the kinds of small packages typically available at gasoline stations and other retailers such as supermarkets.

#### *Impacts on Affected Industry*

In order to determine the impacts of these measures on firewood dealers affected by the proposed Rule amendments, the analysis that follows considers lost revenues relative to estimated net income for these dealers, estimating losses in an average year (4.75 days of additional Mandatory Burn Bans) and a “peak” year (14 days of Mandatory Burn Ban). Based on the estimates of revenue for firewood dealers as shown in Table 4 in the body of this report below, this would amount to an annual decline in sales of between approximately \$78,000 and \$230,000 distributed among the total estimated \$6.21 million in annual sales for all the dealers. Assuming that firewood dealer expenses are directly proportional to revenues, net income and profits would decline by the same percentage. While some costs (obtaining the firewood at wholesale or otherwise, and staffing levels to some degree) would decrease with lower sales, other costs, such as rent or property taxes, are fixed such that operating expenses would actually not decline proportionally, and net income would decrease more than gross revenues on a proportional basis. However, the estimate of impacts is likely overstated, and it is thus unlikely that the decline in net income would be greater than the ARB 10 percent threshold used by the Air District as a benchmark for significant economic impacts. This indicates that the proposed loss in sales related to the proposed rule change does not have the potential for significant adverse economic impacts.

### ***Impacts on Small Businesses***

According to California Government Code 14835, a small business is any business that meets the following requirements:

- Must be independently owned and operated;
- Cannot be dominant in its field of operation;
- Must have its principal office located in California;
- Must have its owners (or officers in the case of a corporation) domiciled in California; and
- Together with its affiliates, be either:
  - A business with 100 or fewer employees, and an average annual gross receipts of \$10 million or less over the previous three tax years, or
  - A manufacturer with 100 or fewer employees.

Assuming these retail firewood sales establishments are independently owned, they would all meet the criteria of California Government Code 14835 for categorization as small businesses, based on having 100 or fewer employees and annual revenues of less than \$10 million, because even as a group they have fewer employees and less revenue than these thresholds. As discussed above, based on impacts on profits, there is no expected potential for significant impacts for any of these businesses meeting the definition of a small business. It should also be noted that this is a very limited number of businesses with few employees and limited revenues.



## DESCRIPTION OF PROPOSED RULE AMENDMENT

Over the last several years, California has experienced some of the deadliest and most destructive wildfires in its history, with wildfire events becoming the “new normal.” As a result, new wildfire prevention initiatives and actions are needed. Climate change is causing higher temperatures and longer dry periods, as well as lengthening the fire season and increasing the risk of wildfires. In addition to destroying entire communities and burning everything in their path, wildfires generate a mixture of fine particulate matter and hazardous chemicals and compounds in the air.

Wildfire smoke presents immediate impacts to local air quality and public health, and atmospheric conditions can quickly transport smoke great distances, with even distant fires affecting the air quality throughout the Bay Area. The fires in Napa and Sonoma County in 2017 and in Butte County in 2018 generated unprecedented levels of particulate matter, which reached hazardous levels never before experienced in the Bay Area.

As a result, the Bay Area Air Quality Management District (“Air District” or “BAAQMD”) proposes to amend Regulation 6, Rule 3 (Rule 6-3) to further protect public health when wildfire smoke affects air quality in the Bay Area, since the current rule limits the Air District’s ability to ban wood burning only during the wintertime November through February period. The proposed 6-3 amendments would extend the Air District’s authority to announce a Spare the Air Alert and ban wood burning or combustion in wood-burning devices year-round whenever particulate matter is forecasted to exceed 35 micrograms per cubic meter (35µg/m<sup>3</sup>). The draft amendment will allow the Air District to ban wood burning any time unhealthy levels of particulate matter are forecasted, and further protect public health when wildfire smoke affects air quality in the Bay Area.

## REGIONAL TRENDS

This section provides background information on the demographic and economic trends for the nine-county San Francisco Bay Area, which represents the Air District’s jurisdiction.<sup>2</sup> Regional trends are compared to statewide demographic and economic patterns since 2000, in order to show the region’s unique characteristics relative to the State and to provide context for the impact analysis.

### Regional Demographic Trends

Table 1 shows the population and household trends for the nine-county Bay Area and California between 2000 and 2019. During this time, the Bay Area’s population increased by 14.7 percent, compared to 17.9 percent for California as a whole. Similarly, the number of Bay Area households grew by 10.4 percent, compared to 13.8 percent growth statewide, as average household size increased in both geographies.

**Table 1: Population and Household Trends, 2000-2019**

<b>Bay Area (a)</b>	<b>2000</b>	<b>2019</b>	<b>Total Change 2000-2019</b>	<b>% Change 2000-2019</b>
<b>Population</b>	6,784,348	7,783,460	999,112	14.7%
<b>Households</b>	2,466,020	2,723,550	257,530	10.4%
<b>Average Household Size</b>	2.69	2.80		
<b>California</b>				
<b>Population</b>	33,873,086	39,927,315	6,054,229	17.9%
<b>Households</b>	11,502,871	13,085,036	1,582,165	13.8%
<b>Average Household Size</b>	2.87	2.99		

Notes:

(a) Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

Sources: California State Department of Finance, 2019; US Census, 2000; BAE 2019.

The Bay Area’s slower growth is tied to its relatively built-out environment, compared to the state overall. While Central Valley locations, such as the Sacramento region, experienced large increases in the number of housing units, the Bay Area experienced more moderate

<sup>2</sup> The Air District’s jurisdiction consists of nine counties, including all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, as well as the western portion of Solano County and the southern portion of Sonoma County. See <http://www.arb.ca.gov/app/dislookup/dislookup.php>

increases in housing units. Nevertheless, the region has still gained almost one million residents since 2000.

## **Regional Economic Trends**

Table 2 shows jobs by sector in 2013 and 2018 for the Bay Area and California. In the five-year period between 2013 and 2018, the Bay Area's employment base grew by 16.2 percent, increasing from 3.44 million jobs to almost 4.00 million jobs, as the economy has shown strong growth. Statewide employment only increased by 13.1 percent from 15.56 million jobs in 2013 to 17.60 million jobs in 2018. The rate of job growth for both the Bay Area and the State over the five-year period was far higher than the rate of population growth, another indicator of the strong recovery from recession.

The largest major economic sectors in the Bay Area economy are Professional & Business Services, Educational & Health Services, Government, and Leisure & Hospitality. Each of these sectors accounted for over 10 percent of all wage and salary employment in the region. Overall, the Bay Area's economic base largely resembles the state's base, sharing a similar distribution of employment across sectors. One noteworthy variation is the higher Bay Area employment in the Professional, Scientific, & Technical Services sector, which makes up 19.3 percent of employment in the Bay Area compared to only 15.1 percent statewide.

All major industry sectors showed an increase in employment in the Bay Area between 2013 and 2018, with increases of greater than 20 percent in Information; Mining, Logging, and Construction; and Transportation, Warehousing, and Utilities. The growth of over 50 percent in Information is especially noteworthy, indicating the continuing importance of the technology economy in the region. Statewide, the same three major sectors showed employment growth of more than 20 percent, but the growth in Information jobs was only 21 percent.

**Table 2: Jobs by Sector, 2013-2018 (a)**

Industry Sector	Bay Area					California				
	2013 (b)		2018 (c)		% Change 2013-2018	2013 (b)		2018 (c)		% Change 2013-2018
	Jobs	% Total	Jobs	% Total		Jobs	% Total	Jobs	% Total	
Agriculture	19,900	0.6%	20,100	0.5%	1.0%	412,400	2.6%	424,200	2.4%	2.9%
Mining, Logging, and Construction	152,400	4.4%	205,400	5.1%	34.8%	666,000	4.3%	882,400	5.0%	32.5%
Manufacturing	313,800	9.1%	362,700	9.1%	15.6%	1,262,500	8.1%	1,325,400	7.5%	5.0%
Wholesale Trade	119,600	3.5%	122,900	3.1%	2.8%	671,300	4.3%	698,900	4.0%	4.1%
Retail Trade	328,100	9.5%	346,000	8.7%	5.5%	1,593,900	10.2%	1,688,600	9.6%	5.9%
Transportation, Warehousing, and Utilities	90,000	2.6%	116,700	2.9%	29.7%	503,800	3.2%	664,000	3.8%	31.8%
Information	138,400	4.0%	211,500	5.3%	52.8%	449,800	2.9%	543,700	3.1%	20.9%
Financial Activities	177,200	5.2%	194,500	4.9%	9.8%	781,200	5.0%	836,300	4.8%	7.1%
Professional & Business Services	645,500	18.8%	771,500	19.3%	19.5%	2,349,200	15.1%	2,663,700	15.1%	13.4%
Educational & Health Services	516,700	15.0%	599,500	15.0%	16.0%	2,309,000	14.8%	2,726,500	15.5%	18.1%
Leisure & Hospitality	371,500	10.8%	432,100	10.8%	16.3%	1,674,800	10.8%	1,986,100	11.3%	18.6%
Other Services, except Public Administration	117,400	3.4%	129,900	3.3%	10.6%	515,500	3.3%	572,100	3.3%	11.0%
Government (d)	449,500	13.1%	483,000	12.1%	7.5%	2,374,300	15.3%	2,587,400	14.7%	9.0%
<b>Total, All Employment (e)</b>	<b>3,440,000</b>	<b>100.0%</b>	<b>3,995,800</b>	<b>100.0%</b>	<b>16.2%</b>	<b>15,563,700</b>	<b>100.0%</b>	<b>17,599,400</b>	<b>100.0%</b>	<b>13.1%</b>
<b>Population</b>	<b>7,417,430</b>		<b>7,751,650</b>		<b>4.5%</b>	<b>38,321,459</b>		<b>39,740,508</b>		<b>3.7%</b>

## Notes:

(a) Includes all wage and salary employment.

(b) Represents annual average employment for calendar year 2013.

(c) Represents annual average employment for calendar year 2018.

(d) Government employment includes workers in all local, state and Federal workers, not just those in public administration. For example, all public school staff is in the Government category.

(e) Totals may not sum from parts due to independent rounding.

Sources: California Employment Development Department, 2019; CA Department of Finance, 2019; BAE, 2019.

## AFFECTED INDUSTRIES

The direct impacts of the proposed amendments to Rule 6-3 will fall on households and others burning wood either as a heat source or for ambiance, rather than on particular industries. Since the direct impacts would result in reduced purchased of firewood, households would see an increase in dollars available for other expenditures rather than negative impacts. One small subsector that might be affected is Direct Selling Firewood Dealers (a subset of NAICS 454310, Fuel Dealers) who could see sales decline due to more limited sales as consumption drops due to an increase in days with a Mandatory Burn Ban.

## SOCIO-ECONOMIC IMPACTS

This section describes the potential direct impacts on users of wood-burning stoves (typically households) and firewood dealers related to the expansion of the Mandatory Burn Ban to being year-round.

There are no direct compliance costs to consumers associated with the ban; it merely prohibits the burning of wood in stoves and fireplaces on certain days of the year. As a result the analysis here assumes no socio-economic impacts on households or other users affected by the ban, and no further analysis of impacts on households and other firewood users is undertaken. The following analysis focuses solely on any potential loss of sales at firewood dealers.

### **Impacts on Firewood Dealers**

As noted previously, firewood dealers may see direct impacts on sales due to possible limitations on the use of firewood on certain additional days of the year. The current rule already bans wood burning on certain days from November through February; impacts of the current ban are thus not considered here. However, as a result of possible restrictions on certain additional days, firewood dealers may face lower sales and reduced revenues.

#### ***Economic Profile of Affected Industry***

Firewood dealers are part of the category defined in the North American Industry Classification System (NAICS) as “Fuel Dealers,” an industry comprising “establishments primarily engaged in retailing heating oil, liquefied petroleum (LP) gas, and other fuels via direct selling,” in NAICS category 454310. More specifically, the Economic Census provides some data specifically for “Other Fuel Dealers,” which are “establishments primarily engaged in retailing fuels, such as coal, wood, or other fuels (except liquefied petroleum gas and heating oil) via direct selling.”

There are a very small number of Bay Area establishments in the Other Fuel Dealers category. According to the 2012 Economic Census (most recent data available), there were only 22 establishments in this category in all of California, and only eight in the San Jose-San Francisco-

Oakland Combined Statistical Area (CSA), which encompasses the Air District’s region.<sup>3</sup> Based on the data available, the dealers in the state employed only 79 workers, and the CSA’s dealers employed a total of between 20 and 79 employees.

**Table 3: Profile of Other Fuel Dealers Industry**

<u>Area</u>	<u>Number of Establishments</u>	<u>2012 Revenues</u>	<u>Number of Employees</u>	<u>Annual Payroll</u>
<b>San Jose-San Francisco-Oakland, CA CSA (a)</b>	8	(b)	(c)	(b)
<b>California</b>	22	\$8,030,000	79	\$1,516,000
<b>United States</b>	156	\$108,702,000	495	\$12,711,000

Note: “Other Fuel Dealers” includes establishments primarily engaged in retailing fuels, such as coal, wood, or other fuels (except liquefied petroleum gas and heating oil) via direct selling. Includes only establishments with payroll.

(a) This Combined Statistical Area (CSA) is the smallest area for which data were available that covered the entire BAAQMD region. CSA includes the nine-county ABAG region plus San Joaquin, Santa Cruz, and San Benito Counties.

(b) Data withheld to avoid disclosing data for individual companies.

(c) 20-99 employees; more detailed data withheld to avoid disclosing data for individual companies.

Source: 2012 Economic Census.

BAE also queried Dun & Bradstreet data and conducted online searches, and obtained the following list of firewood dealers in the Bay Area (see Table 4). This research shows 14 dealers, with 60 employees and annual revenues estimated at approximately \$6.2 million. While this information varies somewhat from the Economic Census for a variety of reasons related to the source,<sup>4</sup> it confirms that there are a limited number of firewood dealers in the Bay Area, and that they have limited employment.

<sup>3</sup> See footnote in table defining the Combined Statistical Area. This was the smallest area for which data were available.

<sup>4</sup> For example, the Duns data may include businesses with no paid wage and salary employees (e.g., sole proprietorships), even though DUNS reports employees at each site. Also, the Economic Census data are from a different time frame, and the DUNS data cannot be confirmed via administrative records that the Census Bureau may have access to.

---

**Table 4: Firewood Dealers in the Bay Area**

---

<u>Business Name</u>	<u>City</u>	<u>Number of Employees</u>	<u>Sales Volume</u>
All Seasons Firewood Llc	Santa Rosa	6	\$510,000
Bahara's Firewood	Sunnyvale	5	\$719,000
Bear Bottom Farms	Richmond	4	\$871,000
Evergreen Firewood	San Jose	2	\$45,000
Firewood Farms	Half Moon Bay	1	\$50,000
Huertaz Firewood Sale	San Jose	3	\$300,000
Hurst Firewood	Vallejo	3	\$980,000
Kosich Firewood	Danville	3	\$142,000
Nero's Designer Firewood	Novato	15	\$1,000,000
Northwinds Firewood Tree Service	Not found	2	\$150,000
Oconnell Ranches-Apple & Firewood Prdct	Sebastopol	4	\$223,000
Summit Tree & Firewood Company	Petaluma	2	\$90,000
Valley Firewood	Novato	3	\$190,000
Xinar Com	Santa Rosa	7	\$940,000
<b>Total</b>		<b>60</b>	<b>\$6,210,000</b>

---

Sources: Dun & Bradstreet; Online Searches; BAE, 2019.

While firewood and other fuel dealers are not the only source for firewood, it is unlikely that decreased sales of firewood products at other retail outlets (e.g., supermarkets or hardware stores) would be substantial enough to impact business adversely. Economic Census data from 2012 indicate that firewood sales do not account for a substantial portion of sales for other types of retailers. For example, as shown in the table below, firewood sales make up less than one percent of sales at gasoline stations that carry the product; for fuel dealers selling firewood, 22 percent of revenues come from sales of firewood.

---

**Table 5: Major Sellers of Wood for Fuel, United States**

---

<u>Type of Retailer (a)</u>	<u>Number of Establishments</u>	<u>Revenues from All Sales (b)</u>	<u>Revenues from Sales of Firewood</u>	<u>As Percent of Total Sales</u>
<b>Gasoline Stations (c)</b>	1,470	\$7,123,480,000	\$12,189,000	0.2%
<b>Fuel Dealers (d)</b>	131	\$210,157,000	\$42,689,000	20.3%

---

(a) Includes retailers where wood sales are listed as a separate product line. Does not include all retailers selling wood for fuel.

(b) Total sales of establishments reporting sales of wood for fuel.

(c) Includes gasoline stations with convenience stores.

(d) Includes all retail fuel dealers, not just Other Fuel Dealers. Data not available for Other Fuel Dealers only.

Source: 2012 Economic Census, Product Line Sales.

### ***Estimated Rate of Return***

Firewood dealers are part of the larger category of nonstore retailers (NAICS 454), which is the most specific category available in the IRS data on net income. For this analysis, 10-year averages were used as a benchmark such that the impacts of any particular year's performance due to economic

fluctuations are lessened. As shown in Table 6, the 10-year average net income as a percent of total receipts for nonstore retailers is 4.3 percent.

**Table 6: Returns on Total Receipts for Nonstore Retailers, 2005-2014, for Active Corporations**

<b>Nonstore Retailers (NAICS 454)</b>	<b>Total Receipts 2005-2014 (in \$000)</b>	<b>Net Income 2005-2014 (in \$000)</b>	<b>Net Income as % of Total Receipts</b>
2005	\$136,893,042	\$5,992,177	4.4%
2006	\$147,442,841	\$8,188,569	5.6%
2007	\$168,372,805	\$7,920,365	4.7%
2008	\$175,536,983	\$6,834,111	3.9%
2009	\$169,826,919	\$7,896,418	4.6%
2010	\$197,730,286	\$7,614,474	3.9%
2011	\$197,347,659	\$7,621,441	3.9%
2012	\$209,855,271	\$9,938,409	4.7%
2013	\$265,206,835	\$8,713,098	3.3%
2014	\$277,516,066	\$10,580,191	3.8%
<b>Average annual net income as % of total receipts (a)</b>			<b>4.3%</b>

(a) Computed based on average net income percentage each year; sums of receipts and net income not used, in order to control for inflation over the time period.

Source: Internal Revenue Service, Returns of Active Corporations, Table 1; BAE, 2019.

### **Compliance Costs**

Firewood dealers do not have costs related to compliance with the amended Rule. The potentially significant losses are related to decreased business, not compliance costs. The decreased business would result from decreased wood burning on Mandatory Burn Ban days.

As shown below in Table 7, the number of such days may vary considerably by year due to short-term weather changes, and long-term due to climate change. Additionally, some of the exceedance days occur within the existing ban period, and thus the proposed rule change would not result in any changes in impacts for those days. Over the 2015 through 2018 period, there were an average of 4.75 exceedance days per year due to wildfires outside the current ban period, but the variation has been considerable over the four years, ranging from zero days in 2016 to 14 days in 2017. So far in 2019, there have been no exceedance days.



---

**Table 7: Bay Area PM2.5 Exceedances 2015-2019**

---

<b>Year</b>	<b>Exceedance Days Due to Wildfires (a)</b>	
	<b>Total</b>	<b>Days Outside Current Ban Period</b>
2015	3	3
2016	0	0
2017	14	14
2018	16	2
<b>Average Days Outside Current Ban Period</b>		4.75

---

(a) Exceedance level is  $>35 \text{ mg/m}^3$  (PM<sub>2.5</sub>).

Source: BAAQMD

Assuming that households and others consume firewood at an even rate throughout the year, and that in an average year they would be restricted from burning on 4.75 additional days, in an average year their firewood consumption would be reduced by approximately 1.3 percent. Using the “worst case” year (14 additional days of banned wood-burning) as the benchmark, firewood consumption would decline by 3.8 percent over the year.

However, these “back of the envelope” estimates of lost sales do not take into account seasonal variations in demand. The expanded burn ban period would cover warmer seasons where the need to burn wood for heating would be less than during the current November to February period. Furthermore, the summer fire season is often associated with unusually hot weather. Many of the exceedance days from 2015 through 2018 were days of extreme heat in the Bay Area, as shown in Table 8; on one of those days (September 1, 2017) San Francisco recorded its hottest temperature ever.

Further analysis indicates that for San Francisco, only one of the 19 additional exceedance days between 2015 and 2018 had temperatures below the annual average; for Livermore, only four exceedance days had temperatures below the annual average. This indicates that overall, firewood consumption for heating on those days would be below annual per day averages. Nevertheless, to be conservative, the estimate of sales loss here is assumed to range from 1.3 to 3.8 percent of annual revenues. It is assumed that the losses will be sustained by these types of businesses; households and businesses heating with wood as their primary fuel are unlikely to be purchasing the kinds of small packages typically available at gasoline stations and other retailers such as supermarkets.

**Table 8: High and Low Temperatures for San Francisco and Livermore (°F)**

Date	San Francisco			Livermore		
	High	Low	Average	High	Low	Average
6/30/2015	75	56	65.5	108	64	86.0
8/15/2015	86	62	74.0	101	59	80.0
8/16/2015	90	60	75.0	106	65	85.5
9/1/2017	106	59	87.5	109	66	87.5
9/2/2017	102	75	88.5	108	69	88.5
9/3/2017	84	65	74.5	106	76	91.0
9/4/2017	79	64	71.5	88	69	78.5
10/9/2017	79	62	70.5	82	54	68.0
10/10/2017	72	52	62.0	85	49	67.0
10/11/2017	66	52	59.0	74	46	60.0
10/12/2017	66	52	59.0	75	41	58.0
10/13/2017	71	52	61.5	78	42	60.0
10/14/2017	77	55	66.0	74	46	60.0
10/15/2017	80	56	68.0	80	43	61.5
10/16/2017	82	60	71.0	85	47	66.0
10/17/2017	75	50	62.5	85	50	67.5
10/18/2017	60	49	54.5	82	44	63.0
8/23/2018	66	59	62.5	76	56	67.0
8/24/2018	66	56	61.0	79	56	67.5
Annual Average	64	51	57.3	73	48	60.3

☐ = days below annual average

Sources: National Weather Service; <https://www.usclimatedata.com>; BAE, 2019.

### ***Economic Impacts Analysis for Affected Industry***

In order to determine the impacts of these measures on firewood dealers affected by the proposed Rule amendments, the analysis that follows considers lost revenues relative to estimated net income for these dealers, estimating losses in an average year (4.75 days of additional Mandatory Burn Bans) and a “peak” year (14 days of Mandatory Burn Ban). Based on the estimates of revenue for firewood dealers as shown in Table 4 above, this would amount to an annual decline in sales of between approximately \$78,000 and \$230,000 distributed among the total estimated \$6.21 million in annual sales for all the dealers. Assuming that firewood dealer expenses are directly proportional to revenues, net income and profits would decline by the same percentage. While some costs (obtaining the firewood at wholesale or otherwise, and staffing levels to some degree) would decrease with lower sales, other costs, such as rent or property taxes, are fixed such that operating expenses would actually not decline proportionally, and net income would decrease more than gross revenues on a proportional basis. However, the estimate of impacts is likely overstated, and it is thus unlikely that the decline in net income would be greater than the ARB 10 percent threshold used by the Air District as a benchmark for significant economic impacts. This indicates that the proposed loss in sales related to the proposed rule change does not have the potential for significant adverse economic impacts.

### ***Small Business Impacts***

According to California Government Code 14835, a small business is any business that meets the following requirements:

- Must be independently owned and operated;
- Cannot be dominant in its field of operation;
- Must have its principal office located in California;
- Must have its owners (or officers in the case of a corporation) domiciled in California; and
- Together with its affiliates, be either:
  - A business with 100 or fewer employees, and an average annual gross receipts of \$10 million or less over the previous three tax years, or
  - A manufacturer with 100 or fewer employees.

Assuming these firewood-selling establishments are independently owned, they would all meet the criteria of California Government Code 14835 for categorization as small businesses, based on having 100 or fewer employees and annual revenues of less than \$10 million; even as a group they have fewer employees and less revenue than these thresholds. As discussed above, based on impacts on profits, there is no expected potential for significant impacts for any of these businesses meeting the definition of a small business.





BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

**Reasons for Exemption:** The Air District determined that the amendments to Reg 5 are exempt from CEQA because the Air District's approval was necessary to prevent or mitigate wildfire-related public health and natural resources emergencies by reducing potential cost barriers associated with prescribed burning, which can prevent emergency wildfires. Additionally, the amendments to Reg 5 would exempt public agencies from incurring Open Burning Fees, which would exist without the rule amendments, when conducting prescribed burns for the purpose of wildfire prevention. Therefore, the Air District's action is a modification of public agency operating expense fees, which is also exempt from CEQA. Likewise, the amendments to Rule 6-3 are necessary to prevent or mitigate a public health emergency during wildfire (or other air quality) events by prohibiting wood burning when air quality is already unhealthy from wildfires, and also exempt from CEQA. The amendments to both rules help assure the protection of the environment and natural resources by removing potential barriers to prescribed burning which is used to prevent larger, more damaging wildfire events, and by prohibiting burning when air quality is unhealthy. There is no possibility that the Air District's action will have a significant effect on the environment.

---

Date Received for Filing

---

Jeffrey Gove  
Director of Compliance and Enforcement  
Bay Area Air Quality Management District

---

Date



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

## California Environmental Quality Act (CEQA)

### NOTICE OF DETERMINATION

---

**TO:** COUNTY CLERK

**FROM:** Bay Area Air Quality  
Management District  
375 Beale Street, Suite 600  
San Francisco, CA 94105  
Contact: Patrick Wenzinger  
(415) 749-4934

**SUBJECT:** FILING OF NOTICE OF DETERMINATION PURSUANT TO CEQA § 21152 AND  
CEQA GUIDELINES § 15094

**Project Title:** AMENDMENTS TO AIR DISTRICT REGULATION 6, RULE 3: WOOD-BURNING  
DEVICES

**Project Applicant and Entity Carrying Out Project:**

Bay Area Air Quality Management District  
375 Beale Street, Suite 600  
San Francisco, California 94105  
(415) 749-4934

**Public Agency Approving Project (Lead Agency):** Bay Area Air Quality Management District (Air District)

**Project Location:** Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties

**Project Description:** This rule development project amends Air District Regulation 6, Rule 3: Wood-Burning Devices (Rule 6-3) by extending the Air District's authority to ban wood burning or combustion in wood-burning devices from only during the wintertime to any day year-round when particulate matter is forecast to exceed 35 micrograms per cubic meter (Reg 6, Rule 3, Sections 211, 224 and 301); and to clarify other existing requirements in the Rule.

**Date of Project Approval:** On Wednesday, November 20, 2019, the Board of Directors of the Air District approved the project described above.

**CEQA Applicability:** The Air District believes this project is exempt from CEQA pursuant to CEQA § 21080(b)(4) and CEQA Guidelines sections 15307, 15308 and 15061(b)(3). The Air District is thus concurrently filing a Notice of Exemption for the Project. This Notice of Determination is filed in the alternative, in an abundance of caution.

**No Significant Impacts:** In 2008, the Air District analyzed the potential environmental impacts of Rule 6-3 – including banning wood burning during forecasted particulate matter exceedances – and concluded in a Final Environmental Impact Report (“Final EIR”), certified on July 9, 2008, that there would be no significant environmental impacts. The most recent amendments to Rule 6-3 only expand the number of days upon which the Air District has the authority to ban wood burning – from solely during the wintertime under the 2008 version of Rule 6-3 to year-round under the current 2019 amendments so as to allow the banning of wood burning during emergency wildfire events no matter when they occur during the year – and this change does not present substantial changes to the project or circumstances or new information that would require a new analysis. The analysis in the Final EIR concluded that there would be no significant environmental impacts

from the banning of wood-burning on any day, and the analysis continues to be applicable to the Air District's current action.

The most recent amendments to Rule 6-3 do not present substantial changes to the project or circumstances or new information that would require a new analysis. Thus, the Air District continues to rely on the Certified EIR pursuant to CEQA § 21166.

**Mitigation Measures:** Mitigation measures were not made a condition of this project. Thus, a mitigation reporting or monitoring plan was not adopted for this project.

**Findings:** The Air District finds that there will be no significant adverse effect on the environment from the adoption of the amendments to Rule 6-3. Because the Final EIR does not identify any significant environmental effects of the Project, no findings were required to be made pursuant to CEQA Guidelines § 15091.

**Overriding Considerations:** A statement of Overriding Considerations was not adopted for this project.

This is to certify that the Final EIR, certified by the Board of Directors of the Bay Area Air Quality Management District on Wednesday, July 9, 2008, with comments and responses and record of project approval is available to public on the Air District's website at [www.baaqmd.gov/ruledev](http://www.baaqmd.gov/ruledev) and at the Air District office at 375 Beale Street, Suite 600, San Francisco, CA 94105.

---

Date Received for Filing

---

Jeffrey Gove  
Director of Compliance and Enforcement  
Bay Area Air Quality Management District

Date

**Final Environmental Impact Report for the  
Bay Area Air Quality Management District's  
Regulation 6, Rule 3: Wood-Burning Devices**

Certified by the Board of Directors on July 9, 2008



**Draft Environmental Impact Report for the  
Bay Area Air Quality Management District's  
Proposed Regulation 6, Rule 3 Wood-Burning Devices**

**May 5, 2008**

*Prepared for:*

Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, CA 94109  
Contact: Eric Pop  
(415) 749-5172

*Prepared By:*

Environmental Audit, Inc.  
1000-A Ortega Way  
Placentia, CA 92870  
Contact: Debra Bright Stevens  
(714) 632-8521

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT**

**DRAFT ENVIRONMENT IMPACT REPORT**

**PROPOSED REGULATION 6, RULE 3: WOOD-BURNING DEVICES**

**TABLE OF CONTENTS**

	Page No.
<b>CHAPTER 1 – INTRODUCTION AND EXECUTIVE SUMMARY</b>	
1.1 Introduction .....	1-1
1.1.1 California Environmental Quality Act.....	1-1
1.1.2 Notice of Preparation and Initial Study .....	1-1
1.1.3 Type of EIR.....	1-2
1.1.4 Intended Uses of This Document.....	1-2
1.1.5 Areas of Controversy .....	1-3
1.1.6 Project Objectives .....	1-4
1.1.7 Document Format .....	1-4
1.2 Executive Summary of Draft EIR .....	1-5
1.2.1 Executive Summary – Chapter 2: Project Description .....	1-5
1.2.2 Executive Summary – Chapter 3: Environmental Setting, Impacts and Mitigation Measures .....	1-5
1.2.3 Executive Summary – Chapter 4: Alternatives.....	1-8
1.2.4 Executive Summary – Chapter 5: Other CEQA Topics .....	1-8
1.2.5 Executive Summary – Chapters 6 and 7: References and Acronyms.....	1-9
<b>CHAPTER 2 – PROJECT DESCRIPTION</b>	
2.1 Introduction .....	2-1
2.2 Project Location .....	2-2
2.3 Background .....	2-3
2.4 Project Objectives.....	2-7
2.5 Proposed Project.....	2-7
<b>CHAPTER 3 – ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES</b>	
3.1 Introduction .....	3-1
3.1.1 Environmental Setting .....	3-1
3.1.2 Thresholds of Significance .....	3-1
3.1.3 Environmental Impacts .....	3-2
3.1.4 Mitigation Measures .....	3-2

3.2	Air Quality.....	3-3
3.2.1	Environmental Setting .....	3-3
3.2.2	Significance Criteria .....	3-24
3.2.3	Environmental Impacts .....	3-26
3.2.4	Mitigation Measures .....	3-31
3.2.5	Cumulative Air Quality Impacts.....	3-32
3.2.6	Cumulative Mitigation Measures.....	3-32
3.3	Conclusion.....	3-32
<b>CHAPTER 4 – ALTERNATIVES</b>		
4.1	Discussion .....	4-1
<b>CHAPTER 5 – OTHER CEQA TOPICS</b>		
5.1	Relationship Between Short-Term and Long-Term Productivity .....	5-1
5.2	Significant Irreversible Environmental Changes .....	5-1
5.3	Growth-Inducing Impacts.....	5-2
<b>CHAPTER 6 – REFERENCES</b>		
6.1	References .....	6-1
6.2	Organizations and Persons Consulted .....	6-1
<b>CHAPTER 7 – ACRONYMS</b>		
	.....	7-1
<b>FIGURES:</b>		
Figure 2-1:	Location of Bay Area Air Quality Management District.....	2-4
Figure 2-2:	PM2.5 Concentration on Peak Days by Constituent in the Bay Area .....	2-6
Figure 3-1:	PM2.5 Concentration on Peak Days by Constituent in the Bay Area .....	3-23
<b>TABLES:</b>		
Table 3-1:	Federal and State Ambient Air Quality Standards.....	3-5
Table 3-2:	Bay Area Air Pollution Summary 2006.....	3-6
Table 3-3:	Summary of 2003 BAAQMD Ambient Air Toxics Monitoring Data.....	3-11
Table 3-4:	Global Warming Potentials (GWPs) for Greenhouse Gases .....	3-12
Table 3-5:	California GHG Emissions and Sinks Summary .....	3-14
Table 3-6:	Greenhouse Gas Emissions by Major Category, BAAQMD.....	3-17
Table 3-7:	Summary of PM Emissions from Wood-Burning Devices by County.....	3-24
Table 3-8:	Air Quality Significance Thresholds for Project Operations.....	3-25
Table 3-9:	Toxic Significance Thresholds for Project Operations.....	3-25
Table 3-10:	Emission Reductions due to Curtailment, Tons per Year.....	3-26
Table 3-11:	GHG Emissions, Direct Comparison, Wood Heat Replaced by Natural Gas Heat.....	3-31

## TABLE OF CONTENTS

---

### APPENDICES:

Appendix A: Notice of Preparation and Initial Study on the Draft EIR

Appendix B: Response to Comments Received on Draft EIR

## **CHAPTER 1**

---

### **INTRODUCTION**

#### Introduction

- California Environmental Quality Act
- Notice of Preparation and Initial Study
- Type of EIR
- Intended Uses of this Document
- Areas of Controversy
- Project Objectives
- Document Format

#### Executive Summary of Draft EIR

- Executive Summary – Chapter 2: Project Description
- Executive Summary – Chapter 3: Environmental Settings,  
Impacts and Mitigation Measures
- Executive Summary – Chapter 4: Alternatives
- Executive Summary – Chapter 5: Other CEQA Topics

## 1.1 INTRODUCTION

The Bay Area Air Quality Management District (BAAQMD or District) was established in 1955 by the California Legislature to control air pollution in the counties around the San Francisco Bay and to attain federal air quality standards by the dates specified in federal law. There have been significant improvements in air quality in the Bay Area over the last several decades. The BAAQMD is also required to meet state standards by the earliest date achievable.

For the last several years the District has been refining the emission inventory for emissions from wood-burning devices, which are a significant source of particulate emissions, and attempting to reduce fine particulates from these devices. Considerable further reductions in emissions from wood-burning devices are available through the implementation of Regulation 6, Rule 3 (Reg 6-3): Particulate Matter and Visible Emissions from Woodburning Devices. The District is proposing to adopt this new rule to ensure these reductions are realized, and to encourage residences and businesses to operate wood-burning devices appropriately to ensure reductions in emissions.

This Environmental Impact Report (EIR) addresses the impacts due to implementation of the Bay Area Air Quality Management District Regulation 6, Rule 3, Woodburning Devices. The District is also proposing to amend District Regulation 1: General Provisions and Definitions, to remove the existing exclusion of residential fires from regulation; and Regulation 5: Open Burning, to require a provision for outdoor recreational fires similar to that proposed in Reg 6-3.

### 1.1.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the potential environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impacts of these projects be identified.

To fulfill the purpose and intent of CEQA, the BAAQMD has prepared this EIR under the requirements of CEQA Guidelines §15187 to address the potential environmental impacts associated with the proposed Regulation 6, Rule 3. Amendments to several other District rules are also proposed in order to allow regulation of this type of source and to maintain consistency with Regulation 6, Rule 3 for similar types of sources. Prior to making a decision on the adoption of the new wood-burning device rule, the BAAQMD Governing Board must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed Rule.

### 1.1.2 NOTICE OF PREPARATION AND INITIAL STUDY

A Notice of Preparation and Initial Study (NOP/IS) for the adoption of District Regulation 6, Rule 3 (included as Appendix A of this EIR) was distributed to responsible

agencies and interested parties for a 30-day review on March 10, 2008. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the BAAQMD’s web site, and was also published in newspapers throughout the area of the BAAQMD’s jurisdiction.

The NOP/IS identified the following environmental resources as being potentially significant, requiring further analysis in the EIR: air quality. The following environmental resources were considered to be less than significant in the NOP/IS: aesthetics, agricultural resources, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities service systems (see Appendix A).

### **1.1.3 TYPE OF EIR**

In accordance with §15121(a) of the State CEQA Guidelines (California Administrative Code, Title 14, Division 6, Chapter 3), the purpose of an EIR is to serve as an informational document that: “will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.”

The EIR is an informational document for use by decision-makers, public agencies and the general public. The proposed project requires discretionary approval and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21000 et seq.).

The focus of this EIR is to address the environmental impacts of the proposed project as identified in the NOP and Initial Study (included as Appendix A of this EIR). The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). Because the level of information regarding potential impacts from the adoption of Regulation 6, Rule 3, is relatively general at this time, the environmental impact forecasts are also general or qualitative in nature.

### **1.1.4 INTENDED USES OF THIS DOCUMENT**

In general, a CEQA document is an informational document that informs a public agency’s decision-makers, and the public generally, of potentially significant adverse environmental effects of a project, identifies possible ways to avoid or minimize the significant effects, and describes reasonable alternatives to the project (CEQA Guidelines §15121). A public agency’s decision-makers must consider the information in a CEQA document prior to making a decision on the project. Accordingly, this EIR is intended to: (a) provide the BAAQMD Governing Board and the public with information on the environmental effects of the proposed project; and, (b) be used as a tool by the BAAQMD Governing Board to facilitate decision making on the proposed project.

Additionally, CEQA Guidelines §15124(d)(1) require a public agency to identify the following specific types of intended uses of a CEQA document:

1. A list of the agencies that are expected to use the EIR in their decision-making;
2. A list of permits and other approvals required to implement the project; and
3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

Other local public agencies, such as cities, county planning commissions, etc., may use the EIR for the purpose of developing projects consistent with Regulation 6, Rule 3 if local building permits are required. No other permits will be required by single purpose public agencies.

### **1.1.5 AREAS OF CONTROVERSY**

In accordance to CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency including issues raised by agencies and the public shall be identified in the EIR. Several areas of controversy have been expressed during public workshops or in the letter received on the NOP.

Concerns that the rule could create extra fuel load for wildland fires were raised during public meetings. No increase in hazards related to wildfires is anticipated from the proposed rule which would apply to existing structures utilizing compliant wood-burning devices. The proposed rule will not create new residential or commercial land use projects. Any new development that might occur in the District would occur for reasons other than the proposed rule. New land use projects would require a CEQA analysis that would evaluate wildfire risks. Mitigation measures would be required to reduce impacts to the maximum extent feasible if the analysis determined such risks to be significant. Proposed Rule 6-3 is not expected to reduce the amount of brush cleared in wildfire hazard areas as the brush clearing is generally required for compliance with fire codes. The burning of brush in wood burning devices under proposed Rule 6-3 could still be accomplished, as long as the brush is seasoned and not burned on curtailment days. The proposed rule does not prevent the California Department of Forestry and Fire Protection (CAL FIRE) or fire districts from conducting controlled burns on non-curtailment days. CAL FIRE is subject to the limitations in Regulation 5: Open Burning. The only change to Regulation 5 would limit recreational fires on curtailment days. Curtailment days only occur about 20 days a year so burning would be allowed on most days (about 345) of the year. In addition, wood can be disposed of in other manners other than burning, such as mulching or chipping. Most wood brush from private property that would be burned is seasoned before burning to produce a desirable (hot) fire. As Rule 6-3 would only provide minor and sporadic delays in burning, no significant impacts are expected.



There is some uncertainty in the appropriate analysis of greenhouse gas emissions from the burning of wood and the comparison to the combustion of natural gas. To respond to this uncertainty, emission estimates for greenhouse gases are evaluated using several different methodologies.

### **1.1.6 PROJECT OBJECTIVES**

CEQA Guidelines §15124(b) requires an EIR to include a statement of objectives, which describes the underlying purpose of the proposed project. The purpose of the statement of objectives is to aid the lead agency in identifying alternatives and the decision-makers in preparing a statement of findings and a statement of overriding considerations, if necessary. The objectives of the proposed Regulation 6, Rule 3 are summarized in the following bullet points.

- reduce particulate matter and visible emissions from wood-burning devices in order to reduce ambient levels of particulate matter in the Bay Area;
- reduce wintertime peak concentrations to attain the federal particulate matter less than 2.5 microns in diameter (PM2.5) standard; and
- further reduce emissions of particulate matter to comply with the State particulate matter less than 10 microns in diameter (PM10) and PM2.5 standards.

### **1.1.7 DOCUMENT FORMAT**

State CEQA Guidelines outline the information required in an EIR, but allow the format of the document to vary [CEQA Guidelines §15120(a)]. The information in the EIR complies with CEQA Guidelines §15122 through §15131 and consists of the following:

Chapter 1: Introduction

Chapter 2: Project Description

Chapter 3: Environmental Setting, Impacts and Mitigation Measures

Chapter 4: Alternatives

Chapter 5: Other CEQA Topics

Chapter 6: References

Chapter 7: Acronyms

Appendix A: Notice of Preparation/Initial Study

## **1.2 EXECUTIVE SUMMARY OF DRAFT EIR**

### **1.2.1 EXECUTIVE SUMMARY – CHAPTER 2: PROJECT DESCRIPTION**

Regulation 6, Particulate Matter and Visible Emissions, Rule 3, Wood-Burning Devices is a proposed new rule initiated by the District’s Particulate Matter Implementation Schedule. It is intended to reduce emissions from wood-burning devices in residences and businesses by curtailing burning during specific periods and regulating fuels and materials to be used in wood-burning devices.

A wood-burning device is any indoor wood-burning stove or insert, pellet-fueled device, conventional fireplace and/or any indoor permanently-installed device burning solid-fuel for aesthetic or space-heating purposes in structures for residential or commercial use. Proposed Rule 6-3 for control of wood-burning devices would:

- Curtail operation of any wood-burning device during periods forecast to negatively impact public health due to PM2.5 levels.
- Establish limitations on visible emissions from wood burning.
- Establish criteria for the sale, transfer or installation of wood-burning devices.
- Establish criteria for the installation of wood-burning devices in new building construction.
- Prohibit the burning of garbage and certain types of materials.
- Establish requirements for the sale of wood products for use in wood burning devices.
- The proposal to amend Regulation 5, Open Burning, would create only a limited exemption for outdoor fires set for recreational purposes which would require curtailment during periods forecast to negatively impact public health due to PM2.5 levels.
- The proposal to amend Regulation 1, General Provisions and Definitions, would remove the language “residential heating” to allow for the regulation of indoor wood-burning devices.

### **1.2.2 EXECUTIVE SUMMARY – CHAPTER 3: ENVIRONMENTAL SETTINGS, IMPACTS AND MITIGATION MEASURES**

#### **1.2.2.1 Air Quality**

##### **Environmental Setting**

It is the responsibility of the BAAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal

government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically. The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NO<sub>x</sub>), and sulfur dioxides (SO<sub>2</sub>). The Air District is not considered to be in attainment with the State PM<sub>10</sub> and PM<sub>2.5</sub> standards. The Bay Area is designated as a marginal non-attainment area for the federal 8-hour ozone standard and as a serious non-attainment area for the California 1-hour ozone standard. The District has been designated as non-attainment for the new State 8-hour standard.

Wood-burning devices generate particulate matter. Combustion of wood also creates carbon dioxide, water vapor, carbon monoxide and volatile organic compounds, including toxic compounds. Partial or incomplete combustion, or burning wood that is not seasoned and dry, or burning garbage or other materials, generates more particulate matter, carbon monoxide, and increases toxic compounds. Residential wood combustion is an important contributor to ambient fine particle levels in the United States.

To estimate the amount of particulate matter coming from wood-burning devices, including fireplaces, District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. The total annual emissions from both wood stoves (1,657 tons per year (tpy)) and fireplaces (5,037 tpy) is estimated to be 6,694 tpy of PM<sub>10</sub>. The total annual emissions from both wood stoves (1,591 tpy) and fireplaces (4,836 tpy) is estimated to be 6,427 tpy of PM<sub>2.5</sub>.

### **Environmental Impacts**

Proposed Rule 6-3 would not generate any new construction. Rule 6-3 proposes that new or used wood stoves sold or installed in the Bay Area would be required to meet EPA Phase II standards for wood burning devices. In addition, new commercial and residential buildings would not be allowed to be constructed with wood burning devices that are not Phase II, pellet or equivalent devices. Natural gas-burning fireplaces or conventional fireplaces with natural gas inserts would be allowed. Therefore, Rule 6-3 is not expected to require or generate additional construction activities or additional construction emissions.

**Operational Emission Impacts:** The overall objective of the proposed project is to reduce PM<sub>10</sub> and PM<sub>2.5</sub> emissions from wood burning devices. The operational PM<sub>10</sub> and PM<sub>2.5</sub> emission reductions were estimated according to the methodology developed

in the Staff Report (BAAQMD, 2007). The overall emission reductions are expected to be in the range of 263 to 917 tpy of PM10 and 254 to 887 tpy of PM2.5, providing an overall beneficial impact on air quality.

Since Rule 6-3 compliant wood burning devices are more efficient, requiring the sale, transfer and installation of only EPA Phase II certified, pellet or equivalent devices would reduce the amount of air toxics emitted. Natural gas is a cleaner burning fuel than wood; therefore, the installation or replacement of pre-EPA approved devices with natural gas appliances would reduce toxic emissions. Therefore, Rule 6-3 is expected to provide beneficial impacts on toxic air contaminants and related beneficial health impacts.

### **Cumulative Impacts**

**Criteria and Toxic Air Contaminants:** Cumulative air quality impacts on criteria and toxic air contaminants due to implementation of proposed Rule 6-3 and all air pollution control rules currently being developed, considered together, are not expected to be significant because implementation of all control measures is expected to result in net emission reductions and overall air quality improvement. Implementation of Rule 6-3 will result in reductions in emissions of PM10, PM2.5, and toxic air contaminants, providing a cumulative air quality and public health benefit. Therefore, no significant adverse cumulative air quality impacts related to criteria and toxic air contaminants are expected.

**Greenhouse Gases:** Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of Greenhouse Gases (GHG) in the atmosphere.

Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHG. As reported by the CEC, California contributes 1.4 percent of the global and 6.2 percent of the national GHG emissions. Approximately 80 percent of GHG in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions.

Depending on the assumptions used and whether or not direct emissions or life cycle emissions are estimated, there is a wide variability in terms of the potential GHG emissions resulting from implementing Rule 6-3. Based on the best available studies and available information about firewood used in the Bay Area, the imposition of a curtailment requirement on some days during the winter season is not expected to result in an increase in GHG emissions.

### **1.2.3 EXECUTIVE SUMMARY – CHAPTER 4: ALTERNATIVES**

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR and the Initial Study (see Appendix A), the proposed new rule is not expected to result in significant impacts to any environmental resources including aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities service systems. Because no significant impacts have been identified for the proposed project, alternatives are not required to be analyzed in this EIR. The requirement to develop alternatives under CEQA Guidelines §15126.6 has been satisfied because no significant adverse impacts were identified for the proposed project. No further discussion of alternatives is required for this EIR.

### **1.2.4 EXECUTIVE SUMMARY – CHAPTER 5: OTHER CEQA TOPICS**

#### **1.2.4.1 Relationship Between Short-term Uses and Long-Term Productivity**

Implementing Rule 6-3 is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. Of the potential environmental impacts discussed in Chapter 3, no significant adverse impacts were identified. The purpose of the proposed rule is to reduce emissions of particulate matter and visible emissions (as well as toxic air contaminants and other criteria pollutants), particularly on winter nights when particulate matter concentrations could exceed the national health-based air quality standard for PM10 and PM2.5. By reducing particulate matter and visible emissions, human exposure to air pollutants would also be reduced, providing long-term health benefits. Therefore, no short-term benefits at the expense of long-term impacts have been identified due to implementation of the proposed rule.

Because no short-term environmental benefits are expected at the expense of long-term environmental goals being achieved, there is no justification for delaying the proposed action. The proposed project should be implemented now as the District is required to make progress toward attaining state and federal particulate matter standards, and has identified it as a control measure in accordance with requirements of Senate Bill 656 (SB 656, Sher).

#### **1.2.4.2 Significant Irreversible Environmental Changes**

Implementation of the proposed rule is not expected to result in significant irreversible adverse environmental changes. Of the potential environmental impacts discussed in Chapter 3, no significant impacts to any environmental resource are expected. Cumulative air quality impacts are expected to be less than significant as implementation of the proposed rule will result in overall emission reductions of PM10 and PM2.5, as

well as TACs, other criteria pollutants, and GHG. Proposed Rule 6-3 is expected to result in long-term benefits associated with improved air quality even though the use of natural gas in the Bay Area may increase. The project would result in reduced emissions, thereby improving air quality and related public health.

#### **1.2.4.3 Growth-Inducing Impacts**

Growth-inducing impacts can generally be characterized in three ways: (1) a project includes sufficient urban infrastructure to result in development pressure being placed on less developed adjacent areas; (2) a large project affects the surrounding community by producing a “multiplier effect,” which results in additional community growth; and (3) a new type of development is allowed in an area, which subsequently establishes a precedent for additional development of a similar character. None of the above scenarios characterize the project evaluated in the EIR since it will control emissions from wood-burning devices.

#### **1.2.5 EXECUTIVE SUMMARY – CHAPTERS 6 AND 7: REFERENCES AND ACRONYMS**

Information on references cited (including organizations and persons consulted) and the acronyms are presented in Chapters 6 and 7, respectively.

## **CHAPTER 2**

---

### **PROJECT DESCRIPTION**

Introduction  
Project Location  
Background  
Project Objective  
Proposed Project

## 2.0 PROJECT DESCRIPTION

### 2.1 INTRODUCTION

Regulation 6, Particulate Matter and Visible Emissions, Rule 3, Wood-Burning Devices is a proposed new rule initiated by the Bay Area Air Quality Management District (BAAQMD) and is included as part of the District's Particulate Matter Implementation Schedule. The purpose of the rule is to limit emissions of particulate matter and visible emissions from wood-burning devices as part of an overall wood smoke reduction program within the jurisdiction of the BAAQMD. Minor changes in current Regulation 1 and Regulation 5 are required as they are necessary to accomplish the associated reductions.

Particulate matter consists of very small liquid and solid particles suspended in the air, and includes particulate matter less than 10 microns equivalent aerodynamic diameter (PM10) as well as finer particulate matter less than 2.5 microns equivalent aerodynamic diameter (PM2.5). Particulate matter is of concern because it can cause serious health effects. People with respiratory illnesses, children, and the elderly are more sensitive to the effects of particulate matter, but it can affect everyone.

The Bay Area experiences its highest particulate matter concentrations in the winter, especially during the evening and night time hours. Wood-burning is the single greatest source contributing to the particulate matter concentrations, based on chemical composition analysis of deposited airborne particulate matter. Emissions calculations indicate wood smoke contributes only about 10 percent of total particulate matter emissions on an annual basis, but approximately 30 percent of total wintertime PM2.5.

During recent winters, the Bay Area Air District exceeded the 24-hour PM2.5 National Ambient Air Quality Standard (NAAQS) 20 to 30 days. The BAAQMD staff anticipates a non-attainment designation for this newly revised standard. The emission limitations in this proposed rule are intended to address this expected non-attainment status and reduce the health impacts of particulate matter in the Bay Area. Reductions in wood smoke emissions will be necessary to achieve clean air on a district-wide basis.

The proposed rule would reduce wintertime PM2.5 levels by curtailing wintertime wood-burning emissions from wood-burning devices, including fireplaces, and achieve additional reductions by requiring cleaner burning technologies in new construction. In addition, non-wintertime burning will be improved by requiring appropriate fuel with low-moisture content be used throughout the year in wood-burning devices. Currently, there is no Air District rule which directly limits emissions from wood-burning devices. Air District Regulation 1 has historically excluded regulation of any fires associated with residential heating and will be amended to remove this exclusion. An amendment to existing Regulation 5, Open Burning, will remove an exemption for outdoor fires set for recreational purposes and create a similar requirement to curtail wintertime wood burning outdoors as well as indoors when air quality conditions dictate.



A wood-burning device is any indoor wood-burning stove or insert, pellet-fueled device, conventional fireplace and/or any indoor permanently-installed device burning solid-fuel for aesthetic or space-heating purposes in structures for residential or commercial use. The proposal for wood-burning devices would:

- Curtail operation of any wood-burning device during periods forecast to negatively impact public health due to PM2.5 levels;
- Establish limitations on visible emissions from wood burning;
- Establish criteria for the sale, transfer or installation of wood-burning devices;
- Establish criteria for the installation of wood-burning devices in new building construction;
- Prohibit the burning of garbage and certain types of materials;
- Establish requirements for the sale of wood products for use in wood burning devices.
- The proposal to amend Regulation 5, Open Burning, would create only a limited exemption for outdoor fires set for recreational purposes which would require curtailment during periods forecast to negatively impact public health due to PM2.5 levels in ambient air.
- The proposal to amend Regulation 1, General Provisions and Definitions, would remove the language “residential heating” to allow for the regulation of indoor wood-burning devices.

## **2.2 PROJECT LOCATION**

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 2-1).

### 2.3 BACKGROUND

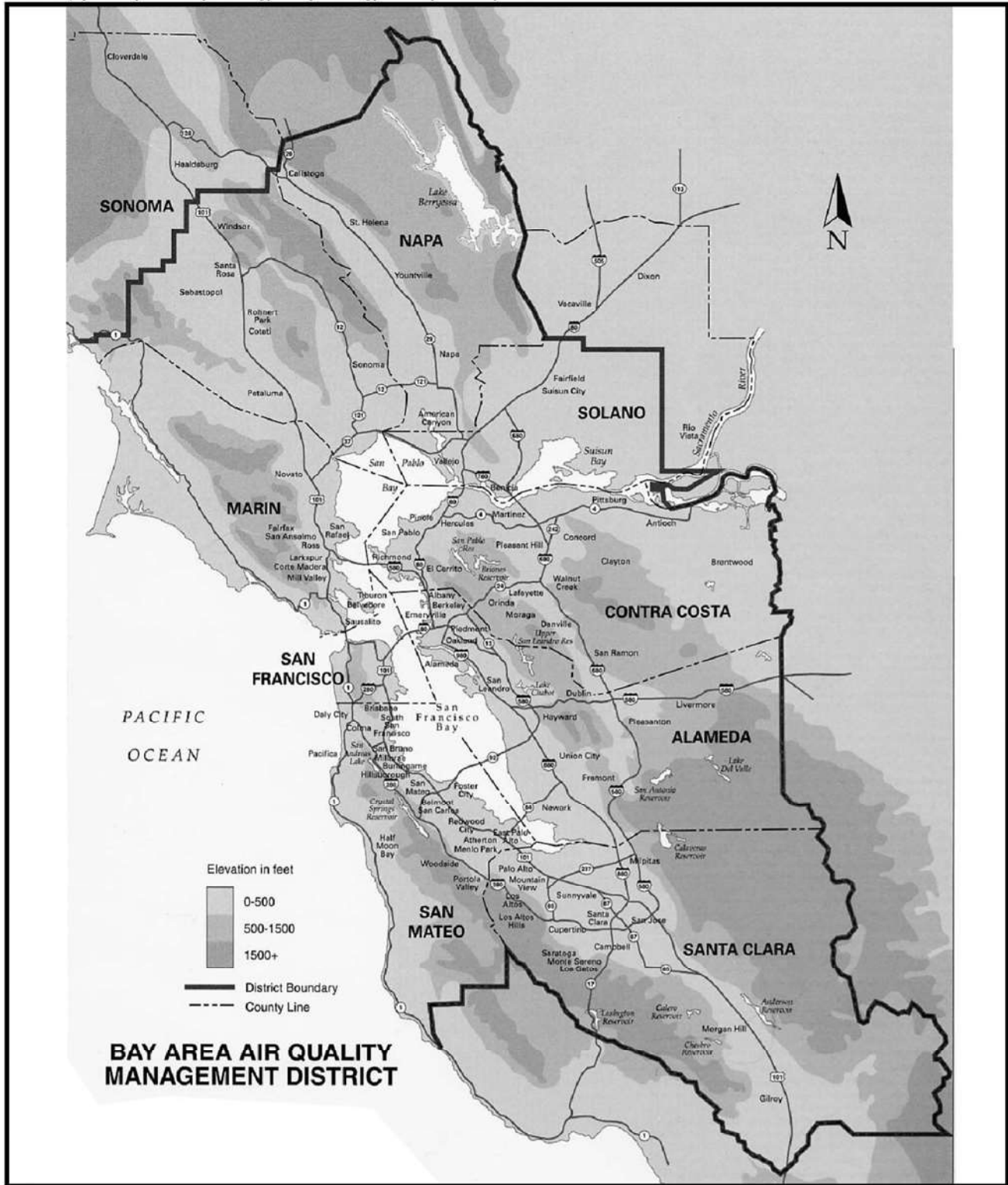
The Bay Area Air Quality Management District (BAAQMD) is proposing adoption of Regulation 6, Particulate Matter and Visible Emissions, Rule 3 Wood-Burning Devices (Rule 6-3). This proposed rule would control air pollution from wood-burning stoves, fireplaces and heaters, including wood pellet stoves. The BAAQMD proposes adoption of Rule 6-3 to reduce emissions of particulate matter and visible emissions, particularly on winter nights when particulate matter concentrations could exceed the national health-based air quality standard for fine particulate matter, or particulate matter of 2.5 microns diameter or less (PM<sub>2.5</sub>). The national 24-hour standard for fine particulate matter in ambient air was lowered from 65 micrograms/cubic meter ( $\mu\text{g}/\text{m}^3$ ), to 35  $\mu\text{g}/\text{m}^3$ , in December 2006.


Currently, fireplaces and wood stoves used to heat residences are exempt from District rules by Regulation 1, Section 110.4. However, from time to time the District receives complaints about residential wood-burning devices, such as excessive smoke and odor. The District's regulations of general applicability, such as Regulation 6 - Particulate Matter and Visible Emissions, and Regulation 7 - Odorous Substances, and the public nuisance standard in Regulation 1 do not apply. District inspectors respond to such complaints with informational literature advising residents of the dangers of particulate matter and how to burn with a minimum of smoke.

The District also has a voluntary program to minimize particulate matter emissions from wood-burning devices, called Spare the Air Tonight (STAT). The STAT program asks residents, via e-mail, the District website and press releases to radio and TV, not to burn during predicted excesses of the 35  $\mu\text{g}/\text{m}^3$  standard for PM<sub>2.5</sub> in ambient air. The STAT season runs from mid-November through mid-February, and has been active since 1991. Typically, there are between 20 and 30 STAT nights, however, during the 2007-2008 season, there were only six. The District has averaged 17 STAT nights in the past five years. During the STAT season, the District follows up with surveys to determine the amount of success of the voluntary program and public attitudes and behaviors associated with wood burning.

In addition, the District has promoted a model ordinance to cities and counties that contains various elements that can reduce particulate matter from wood smoke. The ordinance serves as a template or guidance document for cities and counties that wish to regulate sources of particulate matter in their communities. The model ordinance does not ban wood burning in fireplaces but seeks to take advantage of new, cleaner technologies that have been developed to effectively reduce wood smoke pollution. The model ordinance includes options for mandatory burning curtailments on STAT nights, a requirement that new or re-modeled homes contain only EPA Phase II certified devices, a prohibition on gas to wood heating conversion and limitations on fuel that can be burned.

I:\2591Map (Created) 10/27/04 (Drawn By) M.B. (Check By) D.B.S. (Last Rev.) 10/27/04



 Environmental Audit, Inc.

 NOT TO SCALE

LOCATION OF BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Figure 2-1

When a city or a county adopts all or only parts of the model wood smoke ordinance, enforcement typically takes place through the permit process at local building departments. The ordinance requires residents to provide documentation that the device to be installed is allowed by the ordinance. To date, 41 Bay Area cities and eight counties have adopted aspects of this model ordinance, including a mix of voluntary and mandatory standards.

Finally, the District co-sponsored and managed a financial incentive, or “wood stove change-out”, program in Santa Clara County as part of an air quality mitigation program required by the California Energy Commission. Rebates were offered to residents to upgrade to cleaner burning wood-burning devices. The District’s Cleaner Burning Technology Incentives Program offered a similar District-wide incentive program in 2008.

Wood stoves are wood-burning devices that are enclosed to control combustion. EPA-certified stoves employ either a catalytic or non-catalytic system to increase combustion of the exhaust stream. These units are either stand alone or installed into a building’s walls. A wood-burning insert can be placed in either a new or an existing fireplace.

Some EPA-certified stoves utilize a catalyst to reduce the ignition temperature of volatile gases resulting from wood combustion. A catalyst in a stove is a ceramic honey-combed combustor that is coated with a noble metal, such as platinum or palladium. These types of stoves require maintenance and eventually catalyst replacement during the lifetime of the stove in order to operate properly. The EPA Phase II certification emission limit for catalytic stoves is 4.1 grams per hour (g/hr).

Non-catalytic stoves, on the other hand, achieve low-emission, cleaner burning by decreasing the firebox size, increasing turbulence (mixing) within the firebox, and adding baffles as well as secondary burn tubes to combust emission gases. These stoves still require maintenance to operate effectively, but do not have a catalyst to replace. The EPA certification emission limit for non-catalytic stoves is 7.5 g/hr.

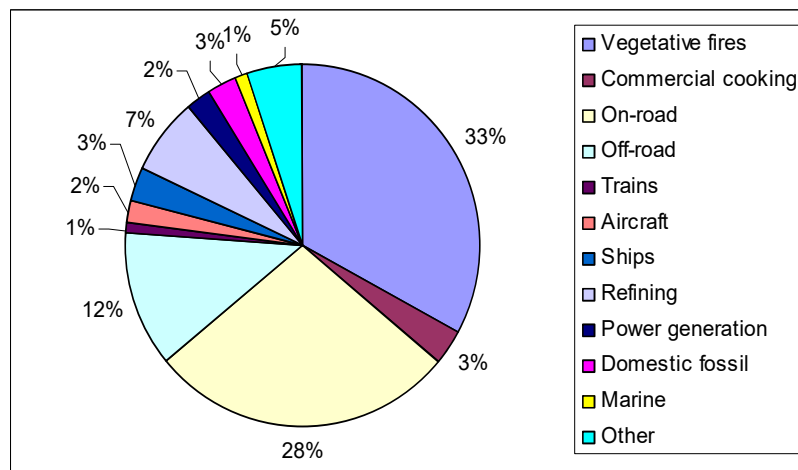
Pellet stoves were developed during the 1970’s to develop alternatives to fossil fuel. These devices burn pellets very cleanly and do not require EPA certification, although many manufacturers have the devices certified by the EPA. Pellet stoves burn wood that has been compressed into pellet form for combustion and easy storage. Some pellet stoves burn products other than wood, such as wheat or corn. In addition to the need to be vented to the outside of the structure, pellet stoves require electricity to operate in order to utilize active air and fuel management systems to control combustion efficiency. Some pellet stoves cannot meet the EPA certification requirements due to excessive air-to-fuel ratios. These stoves, however, are efficient and clean burning.

A masonry heater is a site-built, or site-assembled, solid-fueled heating device consisting of a firebox, a large masonry mass, and a maze of heat exchange channels. While a masonry heater may look like a fireplace, it operates differently. It stores heat from a rapidly burning fire within its masonry structure, and slowly releases the heat over time.

These devices currently do not require EPA-certification.

Wood-burning devices generate particulate matter. Combustion of wood also creates carbon dioxide, water vapor, carbon monoxide and volatile organic compounds, including toxic compounds. Partial or incomplete combustion, or burning wood that is not seasoned and dry, or burning garbage or other materials generates more particulate matter, carbon monoxide, and increases toxic compounds.

Residential wood combustion is an important contributor to ambient fine particle levels in the United States. District staff has identified wood smoke as the single greatest contributor on wintertime peak days (33 percent) to PM2.5 in the Bay Area, as shown in Figure 2-2.



Note: Smoke from residential wood burning constitutes nearly all of the vegetative fires category during peak periods. The other major contributors, agricultural and wildland management burns, are prohibited under District Regulation 5 during “no-burn” days, when peak concentrations occur.

**FIGURE 2-2: PM2.5 Concentration on Peak Days by Constituent in the Bay Area.**

Other studies find results and trends that support emission inventory estimates derived from the District data. The California Air Resources Board (CARB) found (Magliano, 1999) that residential wood combustion makes up 20 percent to 35 percent of wintertime particulate matter.

To estimate the amount of particulate matter coming from wood-burning devices, including fireplaces, District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor were then used to generate a particulate matter 10 microns and below in diameter (PM10) estimate for each county in the Bay Area. Wood stoves and fireplaces are expected to generate 1,657 tons per year (tpy) and 5,037 tpy of PM10 emissions, respectively. Wood stoves and fireplaces are expected to generate 1,591 tpy and 4,836 tpy of PM2.5 emissions, respectively (see Chapter 3 for further details). Because the category of

PM10 also includes PM2.5, a large portion of PM10 particles are also PM2.5 particles. Therefore, the majority of particulate matter from wood smoke are fine particles. It is these fine particles that are of greatest concern to public health.

## 2.4 PROJECT OBJECTIVES

The objective of Rule 6-3 is to reduce particulate matter and visible emissions from wood-burning devices in order to reduce ambient levels of particulate matter in the Bay Area, and to reduce wintertime peak concentrations to attain the federal PM2.5 standard. The Bay Area is also not in attainment with the State particulate matter standards, so further reductions in emissions of particulate matter are needed.

The Bay Area attains the federal annual PM10 standard, but is not in attainment of the California annual PM10 or PM2.5 or the California 24-hour PM10 standard. The Bay Area is unclassified for the federal 24-hour PM10 and new 24-hour PM2.5 standard.

## 2.5 PROPOSED PROJECT

This section presents the proposed Regulation 6, Rule 3 components to reduce particulate matter and visible emissions from wood-burning devices in order to reduce ambient levels of particulate matter in the Bay Area, and to reduce wintertime peak concentrations to attain the federal PM2.5 standard.

**Visible Emissions:** Rule 6-3 proposes to limit visible emissions from wood-burning devices, except six minutes during any one-hour period, to 20 percent visible emissions (equivalent to 1 on a Ringelmann Scale). This opacity limit would not apply during a 20-minute start-up period for any wood fire. This opacity standard is similar to that required of other District operations from stationary sources, including dust from construction sites and any other regulated sources (20 percent visible emissions except for three minutes in any one-hour period). Failure to meet a visible emissions standard is indicative of poor ventilation to a fire, or poorly seasoned or wet wood. Based on District inspection staff observations, this standard is not difficult to meet for properly maintained and operated wood burning devices.

**Prohibit Burning of Garbage:** Rule 6-3 proposes to prohibit the burning of garbage, treated wood, non-seasoned wood, used or contaminated wood pallets, plastic products, rubber products, waste petroleum products, paints and paint solvents, coal, animal carcasses, glossy and/or colored paper, salt water driftwood, particle board, and any material not intended by a manufacturer for use as a fuel in a wood-burning device at any time. These materials produce volatile organic compounds (VOCs), particulate matter and toxic compounds.

**Labeling:** Rule 6-3 proposes to require a label be placed on firewood for sale, including manufactured wood products such as artificial logs and wood pellets. The label would warn consumers about the health impacts from burning wood and where to find out if burning is prohibited. Unseasoned wood (moisture content of greater than 20 percent)

would be required to be labeled as such and contain a notification that burning unseasoned wood is not allowed and provide instructions for seasoning.

**Seasoned wood:** Rule 6-3 proposes to require that seasoned firewood must have a moisture content of 20 percent or less. Only seasoned wood can be burned in a wood-burning device. Unseasoned firewood may be sold, but must include a warning that it is not legal to burn before seasoning and instructions must be provided for seasoning.

**Sale, transfer or installation:** Federal law already requires newly manufactured wood stoves to meet EPA Phase II certification standards. Rule 6-3 proposes to require that wood stoves sold, transferred or installed in the District to meet these standards. Stoves sold as part of a house or other real estate transaction would not be affected by this prohibition.

**New Construction:** Rule 6-3 proposes to allow only EPA certified wood-burning devices or pellet stoves or equivalent devices in new construction. This would prohibit conventional wood-burning fireplaces in new housing developments.

**Burning Curtailment:** Rule 6-3 proposes to limit the ability to burn on STAT nights, defined as a night when the particulate matter is forecast to exceed the 24-hour National Ambient Air Quality Standard of  $35 \mu\text{g}/\text{m}^3$ . An exemption would be provided if wood burning was the sole source of heat for a home.

## **CHAPTER 3**

---

### **ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES**

Introduction  
Air Quality



## **3.0 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES**

### **3.1 INTRODUCTION**

A NOP/IS was prepared for Regulation 6: Particulate Matter and Visible Emissions, Rule 3: Wood-Burning Devices and Amendment of Regulation 5: Open Burning and Regulation 1: General Provisions and Definitions on March 10, 2008 (see Appendix A). The NOP/IS identified air quality as the environmental resource to be potentially significant, requiring further analysis in the EIR. The following environmental resources were considered to be less than significant and will not be further evaluated: aesthetics, agricultural resources, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities service systems.

The environmental resource section is organized into the following subsections: (1) Environmental Setting; (2) Thresholds of Significance; (3) Environmental Impacts; and (4) Mitigation Measures. A description of each subsection follows.

#### **3.1.1 Environmental Setting**

CEQA Guidelines §15125 requires that an EIR include a description of the physical environmental conditions in the vicinity of the proposed project as they exist at the time the NOP/IS is published, or if no NOP/IS is published, at the time the environmental analysis is commenced, from both a local and regional perspective. This Chapter describes the existing environment in the Bay Area as they exist at the time the NOP/IS was prepared (March 2008). The environmental topics identified in this Chapter include both a regional and local setting. The analysis included in this chapter focus on those aspects of the environmental resource areas that could be adversely affected by the implementation of the proposed project (implementation of Regulation 6, Rule 3 and amendment of Regulations 5 and 1) as determined in the NOP/IS (see Appendix A), and not those environmental resource areas determined to have no potential adverse impact from the proposed project.

#### **3.1.2 Thresholds of Significance**

This section identifies the criteria used to determine when physical changes to the environment created as a result of the project approval would be considered significant. The levels of significance for each environmental resource were established by identifying significance criteria. These criteria are based upon those presented in the California Environmental Quality Act (CEQA) environmental checklist and the BAAQMD's CEQA Guidelines (BAAQMD, 1999).

The significance determination under each impact analysis is made by comparing the proposed project impacts with the conditions in the environmental setting and comparing the difference to the significance criteria.

### 3.1.3 Environmental Impacts

The potential impacts associated with each discipline are either quantitatively analyzed where possible or qualitatively analyzed where data were insufficient to quantify impacts. The impacts are compared to the significance criteria to determine the level of significance.

The impact sections of this chapter focus on those impacts that are considered potentially significant per the requirements of the California Environmental Quality Act. An impact is considered significant if it leads to a "substantial, or potentially substantial, adverse change in the environment." Impacts from the project fall within one of the following categories:

**Beneficial** – Impacts will have a positive effect on the resource.

**No Impact:** There would be no impact to the identified resource as a result of the project.

**Less Than Significant:** Some impacts may result from the project; however, they are judged to be less than significant. Impacts are frequently considered less than significant when the changes are minor relative to the size of the available resource base or would not change an existing resource. A “less than significant impact” applies where the environmental impact does not exceed the significance threshold.

**Potentially Significant But Mitigation Measures Can Reduce Impacts to Less Than Significant:** Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to less than significant.

**Potentially Significant or Significant Impacts:** Adverse impacts may occur that would be significant even after mitigation measures have been applied to minimize their severity. A “potentially significant or significant impacts” applies where the environmental impact exceeds the significance threshold, or information was lacking to make a finding of insignificance.

### 3.1.4 Mitigation Measures

This section describes feasible mitigation measures that could minimize potentially significant or significant impacts that may result from project approval. CEQA Guidelines (§15370) defines mitigation to include:

- Avoiding the impact altogether by not taking a certain action or parts of an action.

- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

In accordance with CEQA statutes (§21081.6), a mitigation and monitoring program would be required to be adopted to demonstrate and monitor compliance with any mitigation measures identified in this EIR. The program would identify specific mitigation measures to be undertaken, when the measure would be implemented, and the agency responsible for oversight, implementation and enforcement.

## **3.2 AIR QUALITY**

### **3.2.1 ENVIRONMENTAL SETTING**

The NOP/IS (see Appendix A) determined the air quality impacts of proposed Rule 6-3 as having the potential for significant adverse impacts. Project-specific and cumulative adverse air quality impacts associated with increased emissions of air contaminants (criteria air pollutants; toxic air contaminants, TACs; and greenhouse gas emissions, GHG) have been evaluated in this EIR.

#### **3.2.1.1 Criteria Air Pollutants**

##### Ambient Air Quality Standards

It is the responsibility of the BAAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards, and in the cases of PM<sub>10</sub> and SO<sub>2</sub>, far more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

The state and National Ambient Air Quality Standards (NAAQS) for each of these pollutants and their effects on health are summarized in Table 3-1. CO, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> and SO<sub>2</sub> are directly emitted from stationary and mobile sources. Ozone is not

emitted directly from pollution sources. Instead ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons or reactive organic hydrocarbons (ROG, also commonly referred to as volatile organic compounds or VOCs).

U.S. EPA requires CARB and BAAQMD to measure the ambient levels of air pollution to determine compliance with the NAAQS. To comply with this mandate, the BAAQMD monitors levels of various criteria pollutants at 26 monitoring stations. The 2006 air quality data from the BAAQMD monitoring stations are presented in Table 3-2.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically (see Table 3-3). The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NO<sub>x</sub>), and sulfur dioxides (SO<sub>2</sub>). The Air District is not considered to be in attainment with the State PM<sub>10</sub> and PM<sub>2.5</sub> standards.

The 2006 air quality data from the BAAQMD monitoring stations are presented in Table 3-2. All monitoring stations were below the state standard and federal ambient air quality standards for CO, NO<sub>2</sub>, and SO<sub>2</sub>. The federal 8-hour ozone standard was exceeded 12 days in the District in 2006, while the state 1-hour standard was exceeded on 22 days. The Bay Area is designated as a marginal non-attainment area for the federal 8-hour ozone standard and as a serious non-attainment area for the California 1-hour ozone standard. The State 1-hour ozone standard was exceeded on 18 days in 2006 in the District, most frequently in the Eastern District (Livermore) (see Table 3-2). The District has been designated as non-attainment for the new State 8-hour standard.

**TABLE 3-1: Federal and State Ambient Air Quality Standards**

	<b>STATE STANDARD</b>	<b>FEDERAL PRIMARY STANDARD</b>	<b>MOST RELEVANT EFFECTS</b>
<b>AIR POLLUTANT</b>	<b>CONCENTRATION/ AVERAGING TIME</b>	<b>CONCENTRATION/ AVERAGING TIME</b>	
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	0.08 ppm, 8-hr avg. >	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.>	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 µg/m <sup>3</sup> , annual arithmetic mean > 50 µg/m <sup>3</sup> , 24-hr average>	50 µg/m <sup>3</sup> , annual arithmetic mean > 150 µg/m <sup>3</sup> , 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 µg/m <sup>3</sup> , annual arithmetic mean>	15 µg/m <sup>3</sup> , annual arithmetic mean> 35 µg/m <sup>3</sup> , 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 µg/m <sup>3</sup> , 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m <sup>3</sup> , 30-day avg. >=	1.5 µg/m <sup>3</sup> , calendar quarter>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)		Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent



All monitoring stations were in compliance with the federal PM10 standards. The California PM10 standards were exceeded on 15 days in 2006, most frequently in San Jose. The Air District exceeded the federal PM2.5 standard on ten days, most frequently in San Jose, in 2006 (see Table 3-2).

### 3.2.1.2 Non-Criteria Pollutants

Although the primary mandate of the BAAQMD is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the BAAQMD jurisdiction, the BAAQMD also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. The state and federal governments have set health-based ambient air quality standards for criteria pollutants. The air toxics program was established as a separate and complementary program designed to evaluate and reduce adverse health effects resulting from exposure to TACs.

The major elements of the District's air toxics program are outlined below.

- Preconstruction review of new and modified sources for potential health impacts, and the requirement for new/modified sources with non-trivial TAC emissions to use the Best Available Control Technology.
- The Air Toxics Hot Spots Program, designed to identify industrial and commercial facilities that may result in locally elevated ambient concentrations of TACs, to report significant emissions to the affected public, and to reduce unacceptable health risks.
- Control measures designed to reduce emissions from source categories of TACs, including rules originating from the state Toxic Air Contaminant Act and the federal Clean Air Act.
- The TAC emissions inventory, a database that contains information concerning routine and predictable emissions of TACs from permitted stationary sources.
- Ambient monitoring of TAC concentrations at a number of sites throughout the Bay Area.
- The Community Air Risk Evaluation (CARE) Program evaluates and reduces emissions of TACs in high risk communities.

Historically, the BAAQMD has regulated criteria air pollutants using either a technology-based or an emissions-limit approach. The technology-based approach defines specific control technologies that may be installed to reduce pollutant emissions. The emission limit approach establishes an emission limit, and allows industry to use any emission control equipment, as long as the emission requirements are met. The regulation of TACs requires a different regulatory approach as explained in the following subsections.

#### Air Toxics New Source Review

New and modified source permit applications have been reviewed for air toxics concerns since 1987, in accordance with the Risk Management Policy (RMP) established at the

request of the District's Board of Directors. A large increase in risk screening analyses has occurred in recent years due primarily to the removal of permit exemptions in District regulations for standby engines. Prior to 2000, the District completed screening risk analyses for an average of about 175 permit applications per year. This number increased to 255 in 2000, to 440 in 2001, reached a peak of 602 in 2002, and declined to 430 in 2003. The District has replaced the RMP with Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, which was adopted by the District Board of Directors on June 15, 2005.

Regulation 2, Rule 5 changed the Air Toxics NSR Program by:

- (1) adding a project risk limit for acute health risks ( HI = 1.0 );
- (2) requiring TBACT for chronic non-cancer health risks ( at HI > 0.20 );
- (3) using updated toxicity values and exposure assessment procedures (primarily from OEHHA Air Toxic Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment);
- (4) removing “special” project cancer risk limits for perchloroethylene dry cleaners; and
- (5) eliminating discretionary risk authority for the Air Pollution Control Officer; all sources are limited to cancer risk of 10 in a million and non-cancer Hazard Index of 1.0.

#### Air Toxics Hot Spots Program

The Air Toxics Hot Spots (ATHS) Program involves the evaluation of health risks due to routine and predictable TAC emissions from industrial and commercial facilities. The District has established specific public notification measures for various levels of risk identified under the program (Levels 1, 2, and 3). In 1991, the first year of the risk assessment phase of the program, 30 facilities were identified with Level 1 health risks (cancer risk of 10 in a million or greater) that triggered public notification requirements. The number of facilities requiring public notification had steadily decreased over the first decade of the program as industries reduced toxic emissions and refined estimates of risk. There are currently no major facilities in the Bay Area that require public notification under the ATHS Program. In addition to public notification requirements, the ATHS Program requires facilities to reduce their health risks below levels determined by the air district to be significant within a certain timeframe. The District requires mandatory risk reduction measures for those facilities with health risks of Level 2 or greater (cancer risks of 100 in one million or greater). There are currently no facilities in the Bay Area that have risks identified as Level 2 or greater.

#### Control Measures for Categories of Sources

The California Air Resources Board (CARB) has adopted seventeen Airborne Toxic Control Measures (ATCMs) for stationary sources which the District implements in the



Bay Area. More recent ATCMs include residential waste burning (2003), stationary diesel engines (2004), portable diesel engines (2004), thermal metal spraying (2005), and formaldehyde from composite wood products (2007). CARB revised existing ATCMs for chrome plating and chromic acid anodizing operations and perchloroethylene dry cleaners (included a phase-out of perchloroethylene by 2023).

National Emission Standards for Hazardous Air Pollutants (NESHAPs) developed by U.S. EPA in accordance with Title III of the 1990 federal Clean Air Act Amendments have also become an important source of air toxics control measures in California. These rules generally focus on larger “major source” facilities, and require that emissions be reduced using the Maximum Achievable Control Technology (MACT). Under State law, the District must implement and enforce all MACT Standards, or rules that are at least as stringent. U.S. EPA has already adopted a significant number of new MACT Standards. The focus of future NESHAP development under Title III has shifted to rules that apply to smaller “area source” facilities, e.g., EPA revised the Perchloroethylene Dry Cleaning MACT in July 2006.

### Air Toxics Emission Inventory

The BAAQMD maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The detailed emissions inventory is reported in the BAAQMD, Toxic Air Contaminant Control Program, 2003 Annual Report (BAAQMD, 2007). The 2003 emissions inventory continues to show decreasing emissions of many TACs in the Bay Area. The most dramatic emission reductions in recent years have been for certain chlorinated compounds that are used as solvents including 1,1,1-trichloroethane, perchloroethylene, and trichloroethylene. Additionally, in 2003, there were reductions in other organic TACs such as: toluene, xylene, butyl cellosolve, glycol ethers, and methyl ethyl ketone.

### Targeted Control of TACs Under the Community Air Risk Evaluation Program:

In 2004, BAAQMD established the Community Air Risk Evaluation (CARE) program to identify locations with high emissions of toxic air contaminants (TAC) and high exposures of sensitive populations to TAC and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from TAC emission reductions. For example, BAAQMD will use information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs, community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

Ambient Monitoring Network

Table 3-3 (BAAQMD, 2007) contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2003. Table 3-3 show the calculated cancer risks associated with lifetime exposure to average ambient concentrations of these measured TACs. Of the pollutants for which monitoring data are available, 1,3-butadiene and benzene (which are emitted primarily from motor vehicles) account for slightly over one half of the average calculated cancer risk.

Ambient benzene levels declined dramatically in 1996 with the advent of Phase 2 reformulated gasoline, with significant reductions in ambient 1,3-butadiene levels also occurring. Due largely to these observed reductions in ambient benzene and 1,3-butadiene levels, the calculated network average cancer risk has been significantly reduced in recent years. Based on 2003 ambient monitoring data, the calculated inhalation cancer risk is 143 in one million, which is 53 percent less than the 303 in one million risk that was observed in 1995. These figures do not include the risk resulting from exposure to diesel particulate matter or other compounds not monitored. Although not specifically monitored, recent studies indicate that exposure to diesel particulate matter may contribute significantly to a cancer risk (approximately 500-700 in a million) that is greater than all of the other measured TACs combined. CARB began monitoring for acrylonitrile mid-2003; ambient concentration data will be included for 2004 and in later reports.

**TABLE 3-3: Summary of 2003 BAAQMD Ambient Air Toxics Monitoring Data**

Compound	LOD (ppb) <sup>(1)</sup>	% of Samples < LOD <sup>(2)</sup>	Max. Conc. (ppb) <sup>(3)</sup>	Min. Conc. (ppb) <sup>(4)</sup>	Mean Conc. (ppb) <sup>(5)</sup>
Acetone	0.30	0	121.4	0.6	6.80
Benzene	0.10	1.78	2.4	0.5	0.401
1,3-butadiene	0.15	75.7	0.89	0.075	0.12
Carbon tetrachloride	0.01	0	0.16	0.09	0.108
Chloroform	0.02	62.5	1.47	0.01	0.024
Ethylbenzene	0.10	44.2	0.90	0.05	0.135
Ethylene dibromide	0.02	100	0.01	0.01	0.01
Ethylene dichloride	0.10	100	0.05	0.05	0.05
Methylene chloride	0.50	82.9	3.40	0.25	0.356
Methyl ethyl ketone	0.20	7.7	5.80	0.1	0.496
Metyl tert-butyl ether	0.30	32.9	4.80	0.15	0.532
Perchloroethylene	0.01	42.4	0.28	0.005	0.026
Toluene	0.10	0.2	6.0	0.05	1.062
1,1,1-Trichloroethane	0.05	72.3	2.47	0.025	0.084
Trichloroethylene	0.05	93.8	0.33	0.025	0.029
Trichlorofluoromethane	0.01	0	.046	0.18	0.266
1,1,2-trichlorotrifluoroethane	0.01	0	1.16	0.06	0.077
Vinyl chloride	0.30	100	0.15	0.15	0.15
m/p-xylene	0.10	2.8	3.40	0.05	0.535
o-xylene	0.10	27.9	1.30	0.05	0.186

**NOTES:** Table 4 summarizes the results of the BAAQMD gaseous toxic air contaminant monitoring network for the year 2003. These data represent monitoring results at 19 of the 20 separate sites at which samples were collected. Data from the Fort Cronkhite "clean-air" background site was not included. Data from the Oakland-Davie Stadium site was available from January through March.

- (1) "LOD" is the limit of detection of the analytical method used.
- (2) "% of samples < LOD" is the percent of the total number of air samples collected in 2003 that had pollutant concentrations less than the LOD.
- (3) "Maximum Conc." is the highest daily concentration measured at any of the 19 monitoring sites.
- (4) "Minimum Conc." is the lowest daily concentration measured at any of the 19 monitoring sites.
- (5) "Mean Conc." is the arithmetic average of the air samples collected in 2003 at the 19 monitoring sites. In calculating the mean, samples with concentrations less than the LOD were assumed to be equal to one half the LOD concentration.
- (6) Acrylonitrile data not available for full year and not reported.

### 3.2.1.3 Greenhouse Gases

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in average temperature of the earth's surface and atmosphere. Global warming occurs when the amount of heat trapped in the earth's

atmosphere is greater than the amount radiated. Global warming is a natural phenomenon, whereby the sun’s heat trapped in the atmosphere maintains a habitable temperature and supports life. The heat is trapped and maintained by the presence of “greenhouse gases” or GHG. The GHG absorb longwave radiant energy reflected by the earth, warming the atmosphere. GHG also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect." Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHG. Consequently, concern over the impacts of global warming relate not to the ability of the atmosphere to hold heat, but to the increase in emissions of GHG as the basis for irreversible change in the climate worldwide. Some studies indicate that the potential effects of global climate change may include rising surface temperatures, loss in snow pack, sea level rise, and more extreme heat days per year. One identified cause of global warming is an increase of GHG in the atmosphere. The six major GHG identified by the Kyoto Protocol are CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), haloalkanes (HFCs), and perfluorocarbons (PFCs). In addition, black carbon particles entrained in the atmosphere are implicated in global warming.

Each greenhouse gas differs in its ability to absorb heat in the atmosphere. High global warming potential gases such as HFCs, PFCs, and SF<sub>6</sub> are the most heat-absorbent. Methane (CH<sub>4</sub>) traps over 21 times more heat per molecule than carbon dioxide, and nitrous oxide absorbs 310 times more heat per molecule than carbon dioxide. Often, estimates of greenhouse gas emissions are presented in carbon dioxide equivalents (CO<sub>2</sub>-eq), which weight each gas relative to the global warming potential of carbon dioxide, which has arbitrarily been assigned a value of 1 for comparison purposes. Table 3-4 shows the global warming potentials for different greenhouse gases for 100 year time horizon.

**Table 3-4: Global Warming Potentials (GWPs) for Greenhouse Gases**

Carbon dioxide, CO <sub>2</sub>	1
Methane, CH <sub>4</sub>	21
Nitrous oxide, N <sub>2</sub> O	310
Hydrofluoro- and Perfluoro-carbons, HFC/CFC	6,500
Sulfur hexafluoride, SF <sub>6</sub>	23,900

As reported by the CEC, California contributes 1.4 percent of the global and 6.2 percent of the national GHG emissions (CEC, 2004) in spite of 10 percent of the country’s population. The GHG inventory for California is presented in Table 3-8 (CARB, 2007). Approximately 80 percent of GHG in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions (see Table 3-5).

In response to growing scientific and political concern regarding global climate change, California has recently adopted a series of laws to reduce both the level of GHG in the atmosphere and to reduce emissions of GHG from commercial and private activities within the state. In September 2002, Governor Gray Davis signed Assembly Bill (AB) 1493, requiring the development and adoption of regulations to achieve “the maximum feasible reduction of greenhouse gases” emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the State. Setting emission standards on automobiles is normally the responsibility of the U.S. EPA. The Federal Clean Air Act, however, allows California to set a state-specific emission standard on automobiles if it first obtains a waiver from the U.S. EPA. On December 19, 2007 the U.S. EPA denied California’s request for a waiver. In response, California sued the U.S. EPA claiming that the denial was not based on the scientific data.

In June 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established GHG emissions reduction targets for the state, as well as a process to ensure that the targets are met. As a result of this executive order, the California Climate Action Team (CAT), led by the Secretary of the California State Environmental Protection Agency (CalEPA), was formed. The CAT published its report in March 2006, in which it laid out several recommendations and strategies for reducing GHG emissions and reaching the targets established in the executive order. The greenhouse gas targets are:

- By 2010, reduce to 2000 emission levels;
- By 2020, reduce to 1990 emission levels; and,
- By 2050, reduce to 80 percent below 1990 levels.

**TABLE 3-5: California GHG Emissions and Sinks Summary**  
(Million metric tons, CO<sub>2</sub>-equivalent)

<b>Categories Included in the Inventory</b>	<b>1990</b>	<b>2004</b>
<b>ENERGY</b>	<b>386.41</b>	<b>420.91</b>
<b>Fuel Combustion Activities</b>	<b>381.16</b>	<b>416.29</b>
Energy Industries	157.33	166.43
Manufacturing Industries & Construction	24.24	19.45
Transport	150.02	181.95
Other Sectors	48.19	46.29
Non-Specified	1.38	2.16
<b>Fugitive Emissions from Fuels</b>	<b>5.25</b>	<b>4.62</b>
Oil and Natural Gas	2.94	2.54
Other Emissions from Energy Production	2.31	2.07
<b>INDUSTRIAL PROCESSES &amp; PRODUCT USE</b>	<b>18.34</b>	<b>30.78</b>
Mineral Industry	4.85	5.90
Chemical Industry	2.34	1.32
Non-Energy Products from Fuels & Solvent Use	2.29	1.37
Electronics Industry	0.59	0.88
Product Uses as Substitutes for Ozone Depleting Substances	0.04	13.97
Other Product Manufacture & Use Other	3.18	1.60
Other	5.05	5.74
<b>AGRICULTURE, FORESTRY, &amp; OTHER LAND USE</b>	<b>19.11</b>	<b>23.28</b>
Livestock	11.67	13.92
Land	0.19	0.19
Aggregate Sources & Non-CO <sub>2</sub> Emissions Sources on Land	7.26	9.17
<b>WASTE</b>	<b>9.42</b>	<b>9.44</b>
Solid Waste Disposal	6.26	5.62
Wastewater Treatment & Discharge	3.17	3.82
<b>EMISSION SUMMARY</b>		
<b>Gross California Emissions</b>	<b>433.29</b>	<b>484.4</b>
<b>Sinks and Sequestrations</b>	<b>-6.69</b>	<b>-4.66</b>
<b>Net California Emissions</b>	<b>426.60</b>	<b>479.74</b>

Source: CARB, 2007.

In September 2006, Governor Schwarzenegger signed California's Global Warming Solutions Act of 2006 (AB32). AB32 will require CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions, by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of GHG emissions by January 1, 2008;

- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions; and,
- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHG by January 1, 2011.

California Senate Bill 97 (SB97), passed in August 2007, is designed to work in conjunction with CEQA and AB32. SB97 requires the California Office of Planning and Research (OPR) to prepare and develop guidelines for the mitigation of GHG emissions or the effects thereof, including but not limited to, effects associated with transportation and energy consumption. These guidelines must be transmitted to the Resources Agency by July 1, 2009, to be certified and adopted by January 1, 2010. The OPR and the Resources Agency shall periodically update these guidelines to incorporate new information or criteria established by CARB pursuant to AB32. SB97 will apply to any EIR, negative declaration, mitigated negative declaration, or other document required by CEQA, prepared for a limited number of types of projects, which has not been finalized. SB 97 will be automatically repealed January 1, 2010.

The BAAQMD has also initiated a Climate Protection Program. On June 1, 2005 the Air District Board of Directors adopted a resolution establishing a Climate Protection Program and acknowledging the link between climate protection and programs to reduce air pollution in the Bay Area. A central element of the District's climate protection program is the integration of climate protection activities into existing District programs. The District is seeking ways to integrate climate protection into current District functions, including grant programs, CEQA commenting, regulations, inventory development, and outreach. In addition, the District's climate protection program emphasizes collaboration with ongoing climate protection efforts at the local and State level, public education and outreach and technical assistance to cities and counties.

The District has contracted two reports on potential mitigation of greenhouse gas emissions from Bay Area stationary sources. The reports were titled "Opportunities for Further Greenhouse Gas Emission Reductions for the BAAQMD Stationary Sources" and "Greenhouse Gas Mitigation: Landfill Gas and Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters." The first gave an overview of the potential areas for regulatory activity to reduce greenhouse gas emissions at Bay Area sources, and the second focused on two of the most promising categories, landfills and boilers.

The Climate Protection Grant Program is another aspect of the District's efforts to reduce greenhouse gas emissions. In 2007, the District awarded \$3 million to fund 53 local projects to reduce the Bay Area's carbon footprint. This \$3 million represents the largest single source of funding available for climate protection projects in the Bay Area. Grants were made to Bay Area local governments and non-profit organizations for implementation of innovative projects to reduce greenhouse gas emissions.

The District has developed a Source Inventory of Bay Area Greenhouse Gas Emissions, published in November, 2006. In it, GHG emissions from various sources are calculated for each applicable GHG, and CO<sub>2</sub>-eq emissions are determined. The emissions focuses on direct GHG emissions due to human activities including commercial, transportation, domestic, forestry and agriculture activities in the San Francisco Bay region. This Source Inventory does not include indirect emissions, for example, electricity used by an industrial source or residence is not included, although emissions from Bay Area power plants are. Point sources, or sources of emissions that require BAAQMD permits are calculated directly from data submitted to BAAQMD by each facility, but area sources, which are groups of numerous small emission sources that do not require permits but collectively emit significant amounts of air pollutants, have been calculated based on estimated activities and emission factors for various categories. In addition, the emissions from mobile sources, such as cars, trucks, buses, boats, ships trains and aircraft have been calculated based on CARB's EMFAC2002 model or based on estimated fuel used and emissions factors.

The greenhouse gas with the greatest emissions is carbon dioxide (CO<sub>2</sub>). Carbon dioxide emissions from various activities in the Bay Area represented 89.9 percent of total greenhouse gas emissions in 2002. Carbon dioxide emissions are mainly associated with combustion of carbon-bearing fossil fuels such as gasoline, diesel, and natural gas used in mobile sources and energy-generation-related activities. Other activities that produce CO<sub>2</sub> emissions include cement manufacturing, waste combustion, and waste and forest management. Methane (CH<sub>4</sub>) emissions from various sources represent 4.5 percent of Bay Area's total CO<sub>2</sub>-eq GHG emissions. Landfills, natural gas distribution systems, agricultural activities, fireplaces and wood stoves, stationary and mobile fuel combustion, and gas and oil production fields categories are the major sources of these emissions. Nitrous oxide (N<sub>2</sub>O) emissions represent approximately 5 percent of the overall GHG inventory. Municipal wastewater treatment facilities, fuel combustion, and agricultural soil and manure management are the major contributors of nitrous oxide emissions in the Bay Area. Emissions from high global warming potential gases such as HFCs, PFCs and SF<sub>6</sub> make up approximately one half percent of the total CO<sub>2</sub>-eq emissions. Industrial processes such as semiconductor manufacturing and electric power transmission and distribution systems are the major sources of HFCs, PFCs and SF<sub>6</sub> emissions in the Bay Area.

Direct GHG emissions by major source categories are shown in Table 3-6. Fossil fuel consumption in the transportation sector was the single largest source of Bay Area's GHG emissions in 2002. The transportation sector alone contributed 50.6 percent of GHG emissions in the Bay Area. Categories included in this sector are on-road motor vehicles, off-highway mobile sources, and aircraft.

Industrial and commercial sources (excluding petroleum refining and power plants, which are reported separately) were the second largest contributors of GHG emissions with 25.7 percent of total emissions. Industrial, commercial, and other sources include emissions from industrial processes such as waste management, cement manufacturing, fuel distribution, agriculture and forest management, and some other small sources.



Domestic sources, the third largest category, includes emissions from domestic combustion, but does not, as stated above, include impacts from electricity use. Domestic combustion includes emissions from residential furnaces, water heaters and cooking. Table 3-6 shows the relative and total contribution of major categories of emissions of GHG in the Bay Area. Based on population and emissions trends, the total amount of GHG emissions in the Bay Area has been estimated to be 95.8 million tons for 2008. Of this total, domestic combustion has been estimated to be 9.9 million tons, a slightly smaller percent of the total, at 10.3%.

**Table 3-6: 2002 Greenhouse Gas Emissions by Major Category, BAAQMD**

Major Category	Percent Contribution	CO2-eq (Million Tons/year)
Transportation	50.6%	43.2
Industrial/Commercial	25.7%	22.0
Power Plants	7.2%	6.1
Oil Refining	5.6%	4.8
Domestic	10.9%	9.3
<b>Total</b>	<b>100%</b>	<b>85.4</b>

### 3.2.1.4 Health Effects

#### Criteria Pollutants

Particulate Matter (PM10 & PM2.5): Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems. Exposure to particulate pollution is linked to increased frequency and severity of asthma attacks and even premature death in people with pre-existing cardiac or respiratory disease. Those most sensitive to particulate pollution include infants and children, the elderly, and persons with impaired heart and lung function and immunology systems. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Ambient PM is made up of particles that are emitted directly, such as soot and fugitive dust, as well as secondary particles that are formed in the atmosphere from reactions involving precursor pollutants such as oxides of nitrogen, sulfur oxides, volatile organic

compounds, and ammonia. Secondary PM and combustion soot tend to be fine particles (PM 2.5), whereas fugitive dust is mostly coarse particles. Directly-emitted particles come from a variety of sources such as cars, trucks, buses, industrial facilities, power plants, construction sites, tilled fields, unpaved roads, stone crushing, and burning of wood. Other particles are formed indirectly when gases from burning fuels react with sunlight and water vapor. These particles are an indirect product from fuel combustion in motor vehicles, at power plants, and in other industrial processes. Many combustion sources, such as motor vehicles and power plants, both emit PM directly and emit pollutants that form secondary PM.

In addition, particulate matter is responsible for a variety of other detrimental environmental effects, including visibility impairment, atmospheric deposition, aesthetic damages and public nuisances.

**Ozone:** Ozone (O<sub>3</sub>), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm).

While ozone is beneficial in the stratosphere because it filters out skin cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells, and ambient ozone concentrations in the Bay Area are occasionally sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection. People with respiratory diseases, children, the elderly, and people who exercise heavily are more susceptible to the effects of ozone.

Plants are also sensitive to ozone, at concentrations well below the health-based standards and ozone is responsible for significant crop damage. Ozone is also responsible for damage to forests and other ecosystems.

**Volatile Organic Compounds (VOCs):** It should be noted that there are no state or national ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because VOC emissions contribute to the formation of ozone. They are also transformed into organic aerosols in the atmosphere, contributing to higher PM<sub>10</sub> and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOCs because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low

concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

**Carbon Monoxide (CO):** CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the Basin exhibit large spatial and temporal variations, due to variations in the rate at which CO is emitted, and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable atmospheric portion of the day.

When CO is inhaled in sufficient concentration, it can displace oxygen and bind with the hemoglobin in the blood, reducing the capacity of the blood to carry oxygen. Individuals most at risk from the effects of CO include heart patients, fetuses (unborn babies), smokers, and people who exercise heavily. Normal healthy individuals are affected at higher concentrations, which may cause impairment of manual dexterity, vision, learning ability, and performance of work. The results of studies concerning the combined effects of CO and other pollutants in animals have shown a synergistic effect after exposure to CO and ozone.

**Nitrogen Dioxide (NO<sub>2</sub>):** NO<sub>2</sub> is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N<sub>2</sub>) and oxygen (O<sub>2</sub>) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO<sub>2</sub>. NO<sub>2</sub> is responsible for the brownish tinge of polluted air. The two gases, NO and NO<sub>2</sub>, are referred to collectively as NO<sub>x</sub>. In the presence of sunlight, NO<sub>2</sub> reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO<sub>3</sub>) which reacts further to form nitrates, which are a component of PM<sub>10</sub>.

NO<sub>2</sub> is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

Sulfur Dioxide (SO<sub>2</sub>): SO<sub>2</sub> is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), which contributes to acid precipitation, and sulfates, which are a component of PM<sub>10</sub> and PM<sub>2.5</sub>. Most of the SO<sub>2</sub> emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, SO<sub>2</sub> affects breathing and the lungs' defenses, and can aggravate respiratory and cardiovascular diseases. Asthmatics and people with chronic lung disease or cardiovascular disease are most sensitive to its effects. SO<sub>2</sub> also causes plant damage, damage to materials, and acidification of lakes and streams.

### Non-Criteria Pollutants

Toxic Air Contaminants: Chemicals are considered toxic if exposure to the compound causes adverse effects in a living organism. In order for the chemical to illicit an adverse effect, it must gain entry into the body through either inhalation (respiratory tract), ingestion (gastrointestinal tract), and dermal contact (skin). Most toxic substances do not cause harmful effects at the point of entry. Instead, entry into the body starts the physiological processes of the body to either absorb, distribute, store, transform, and eliminate the chemical. To produce a toxic effect, the chemical or its biotransformation product must reach a sensitive body organ at sufficient high concentration for an extended period of time.

The rates at which toxic compounds are absorbed, metabolized, and eliminated are very critical. If the body eliminates a toxic compound rapidly, it may tolerate an otherwise toxic dose when partitioned into fractional doses. If the body eliminates a toxic compound slowly, a low dose over a long period could result in accumulation of the toxic compound to a critical concentration. Exposure times may range from one day to a person's lifetime. In humans, the following criteria may be used to characterize exposure:

- Acute: 1 day
- Sub-acute: 10 days
- Sub-chronic: 2 weeks to 7 years
- Chronic: 7 years to lifetime

Once the toxic compound reaches the body organ, the toxic compound joins, or binds with a molecule or a group of molecules from a cell of a target organ, called an enzyme. The binding of the toxic compound interferes with the normal beneficial biochemical reactions of the human body or initiate abnormal metabolic reactions, resulting in adverse effect. The effects may be short term effects such as headaches or nausea. They can also be fatal.

The common way of classifying toxic effects from chemical exposure is through two broad categories: carcinogenic effects and non-carcinogenic effects. Carcinogenic compounds induce cancer while non-carcinogenic effects comprise all other effects. Carcinogenic compound can be further divided into genotoxic and non-genotoxic

compounds. Genotoxic carcinogens initiate and progress mutations necessary for the development of human cancer while non-genotoxic carcinogens speed up development of malignancy through immunosuppression. For non-carcinogenic compounds, human may exhibit developmental and reproduction effects from exposure to the compound such that actual impact is unknown until the latter stages of life.

Toxicity studies with laboratory animal or epidemiological studies of human populations provide the data used to develop toxicity criteria which determines the relationship between the exposure of the chemical compound to the nature and magnitude of the adverse health effects. For carcinogenic effects, numerical estimates of cancer potency, defined as cancer slope factor, determine the cancer risk due to constant lifetime exposure. Carcinogenic slope factors assume no threshold for effects such that exposure to any level of concentration is likely to produce a carcinogenic effect.

For non-carcinogens, reference dose is used as a health threshold. The reference dose is an estimate of a daily exposure to the human population including sensitive subgroups that is likely to be without an appreciable risk of deleterious effects during a lifetime of exposure.

#### Greenhouse Gases

Greenhouse gases do not have human health impacts like criteria or toxic pollutants. Rather, it is the increased accumulation of GHG in the atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the implications on human health. The effects of global warming due to an increase in GHG in the atmosphere may lead to higher maximum temperatures, more hot days and heat waves, resulting in an increase in deaths and serious illness among older age groups and urban poor, increased risk of disease epidemics, increased stress in livestock and wildlife and increased risk of crop damage; more intense precipitation events resulting in increased soil erosion, flooding, landslide, mudslide and avalanche danger; and increased summertime drying resulting in decreased water quality and quantity, increased risk of foundation damage due to ground shrinkage and increased forest fires among other potential direct and indirect impacts to human health.

#### **3.2.1.5 Current Emission Sources**

The two broad categories of emission sources include stationary and mobile sources.

##### Stationary Sources

Stationary sources can be further divided between point and area sources.

**Point Sources:** Point sources are those that are identified on an individual facility or source basis, such as refineries and manufacturing plants. BAAQMD maintains a computer data bank with detailed information on operations and emissions characteristics

for nearly 4,000 facilities, with roughly 20,000 different sources, throughout the Bay Area. Parameters that affect the quantities of emissions are updated regularly.

**Area Sources:** Area sources are stationary sources that are individually very small, but that collectively make a large contribution to the inventory. Many area sources do not require permits from the BAAQMD, such as residential heating, and the wide range of consumer products such as paints, solvents, and cleaners. Some facilities considered to be area sources do require permits from the BAAQMD, such as gas stations and dry cleaners. Emissions estimates for area sources may be based on the BAAQMD data bank, calculated by CARB using statewide data, or calculated based on surrogate variables. Wood stoves are considered area sources.

### Mobile Sources

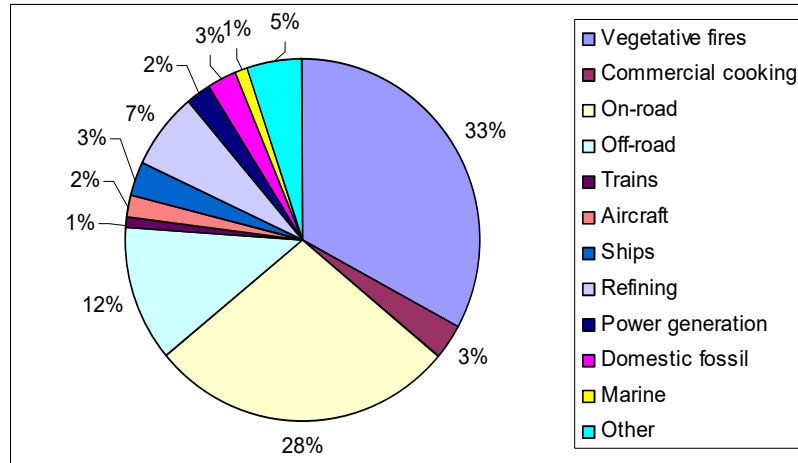
Mobile sources include on-road motor vehicles such as automobiles, trucks, and buses, as well as off-road sources such as construction equipment, boats, trains, and aircraft. Estimates of on-road motor vehicle emissions include consideration of the fleet mix (vehicle type, model year, and accumulated mileage), miles traveled, ambient temperatures, vehicle speeds, and vehicle emission factors, as developed from comprehensive CARB testing programs. The BAAQMD also receives vehicle registration data from the Department of Motor Vehicles. Some of these variables change from year to year, and the projections are based upon expected changes. Emissions from off-road mobile sources are calculated using various emission factors and methodologies provided by CARB and U.S. EPA.

#### **3.2.1.6 Emissions From Wood Burning Devices**

Wood-burning devices generate particulate matter. Combustion of wood also creates carbon dioxide, water vapor, carbon monoxide and volatile organic compounds, including toxic compounds. Partial or incomplete combustion, or burning wood that is not seasoned and dry, or burning garbage or other materials generates more particulate matter, carbon monoxide, and increases toxic compounds.

Residential wood combustion is an important contributor to ambient fine particle levels in the United States. District staff has identified wood smoke as the single greatest contributor on wintertime peak days (33 percent) to PM<sub>2.5</sub> in the Bay Area, as shown in Figure 3.1.

**FIGURE 3-1: PM2.5 Concentration on Peak Days by Constituent in the Bay Area.**



Note: Smoke from residential wood burning constitutes nearly all of the vegetative fires category during peak periods. The other major contributors, agricultural and wildland management burns, are prohibited under District Regulation 5 during “no-burn” days, when peak concentrations occur.

Other studies find results and trends that support emission inventory estimates derived from the BAAQMD data. The California Air Resources Board (CARB) found (Magliano, 1999) that residential wood combustion makes up 20 percent to 35 percent of wintertime particulate matter.

To estimate the amount of particulate matter coming from wood-burning devices, including fireplaces, District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor were then used to generate a particulate matter 10 microns and below in diameter (PM10) estimate for each county in the Bay Area. These data are summarized in Table 3-7 in tons per day (tpd) and tons per year (tpy), for both PM10 and PM2.5.

**TABLE 3-7: Summary of PM Emissions from Wood-Burning Devices by County**

<b>County</b>	<b>Wood Stove PM<sub>10</sub> (tpd)</b>	<b>Fireplace PM<sub>10</sub> (tpd)</b>	<b>Wood Stove PM<sub>2.5</sub> (tpd)</b>	<b>Fireplace PM<sub>2.5</sub>(tpd)</b>
Alameda	0.03	2.28	0.03	2.19
Contra Costa	0.76	4.32	0.73	4.15
Marin	1.03	0.37	0.99	0.36
Napa	0.33	0.41	0.32	0.39
San Francisco	0.03	0.28	0.03	0.27
San Mateo	0.38	0.70	0.36	0.67
Santa Clara	0.65	3.11	0.62	2.99
Solano	0.05	0.89	0.05	0.85
Sonoma	1.27	1.43	1.22	1.37
<b>Total Emissions (tons per day)</b>	<b>4.54</b>	<b>13.80</b>	<b>4.36</b>	<b>13.25</b>
<b>Total Emissions (tons per year)</b>	<b>1657</b>	<b>5037</b>	<b>1591</b>	<b>4836</b>

Because the category of PM10 also includes PM2.5, a large portion of PM10 particles are also PM2.5 particles. Therefore, the majority of particulate matter from wood smoke are fine particles which are of the greatest concern to public health.

Wood smoke emissions also has been found to contain numerous non-criteria pollutants, including toxic and carcinogenic air contaminants. These include formaldehyde and other aldehydes, chlorinated dioxins, and polyaromatic hydrocarbons (PAH). Among the PAH compounds present are pyrene, benzo(a)pyrene, benzo(e)pyrene, anthracene, fluoranthene, benzo(a)anthracene, benzo(a)fluoranthene, and chrysene.

Wood stoves emit greenhouse gases, including carbon dioxide and methane.

### 3.2.2 SIGNIFICANCE CRITERIA

#### 3.2.2.1 Criteria Air Pollutants

The BAAQMD complies with the provisions of CEQA when they approve an individual project as lead agency or when they approve a regional project such as adoption of a rule or an air quality planning document. BAAQMD has established significance criteria, as discussed below. To determine whether or not air quality impacts from the proposed project are significant, impacts will be evaluated and compared to the significance criteria in Table 3-8. If impacts equal or exceed any of the following criteria, they will be considered significant.

Criteria air pollutants have a regional impact, meaning that the emissions have the potential to degrade the air quality in the Bay Area as a whole. The thresholds for ROG and NOx are equivalent to the BAAQMD offset requirement threshold (15 tons per year)



for stationary sources (Regulation 2-2-302). The threshold for PM10 is based on the BAAQMD's definition of a major modification to a major facility (Regulation 2-2-221). The carbon monoxide threshold is based on the potential of a project to exceed the state ambient air quality standard for CO, 9.0 ppm averaged over eight hours, or 20 ppm averaged over one hour.

**TABLE 3-8: Air Quality Significance Thresholds for Project Operations**

<b>Significance Thresholds for Regional Impacts</b>	
<b>Pollutant</b>	<b>Significance Threshold</b>
ROG	15 tons/yr; 80 lbs/day; 36 kg/day
NO <sub>x</sub>	15 tons/yr; 80 lbs/day; 36 kg/day
PM10	15 tons/yr; 80 lbs/day; 36 kg/day
CO	550 lbs/day

**3.2.2.2 Non-Criteria Pollutants**

Significance criteria for toxic air contaminants (TACs) are evaluated on a localized basis. The impacts of an increase in toxic air contaminants, unlike regional pollutants, may not be significant on a regional basis, but may be significant in their effect on populations located nearby the source. For this reason, significance criteria are based on the District's Risk Management Policy. Table 3.9 shows the significance thresholds for toxic air contaminants.

**Table 3-9: Toxic Significance Thresholds for Project Operations**

<b>Significance Thresholds for Localized Impacts</b>	
<b>Pollutant</b>	<b>Significance Threshold</b>
Toxic Air Contaminants (TACs)	Maximum Exposed Individual (MEI) Cancer Risk $\geq$ 10 in 1 million Hazard Index $\geq$ 1.0 at the MEI

**3.2.2.3 Greenhouse Gases**

The analysis of GHG is a much different analysis than the analysis of criteria pollutants. For criteria pollutants, significance thresholds are based on daily emissions because attainment or non-attainment is based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects on human health, e.g., one-hour and eight-hour. For non-criteria pollutants like toxic air contaminants, significance thresholds are based on risk to nearby receptors. The effects of GHG, however, are much longer term, affecting global climate over a relatively long time frame. In addition, GHG do not have health effects like criteria pollutants or toxic air contaminants. It is the increased accumulation of GHG in the atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project.

While direct GHG emissions can, in some cases, be calculated, the emissions cannot be precisely correlated with specific impacts based on currently available science. Climate change is a global phenomenon, making it difficult to develop the scientific tools and policy needed to select a CEQA significance threshold for climate change or GHG emissions on a regional or local level. As there are currently no emission significance thresholds to assess GHG emission effects on climate change, neither the BAAQMD nor any other California lead agency currently has a “significance threshold” to determine whether a new rule or project will have a significant impact on global warming or climate change. In the absence of regulatory guidance, and before the resolution of various legal challenges related to global climate change analysis and the selection of significance thresholds, a significance determination will be made on a case-by-case basis.

**3.2.3 ENVIRONMENTAL IMPACTS**

**3.2.3.1 Criteria Air Pollutants**

The overall objective of the proposed project is to reduce PM10 and PM2.5 emissions from wood burning devices. Rule 6-3 would reduce emissions of criteria pollutants by prohibiting wood-burning devices in new construction unless they were EPA Phase II certified equipment or pellet stoves, restricting the sale or transfer of new or used wood burning devices to EPA Phase II certified equipment or pellet stoves, prohibiting the use of wood-burning devices during curtailment periods, and restricting materials burned in wood burning appliances.

To estimate the amount of PM coming from wood-burning devices, including fireplaces, Air District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor for each device were then used to generate an estimate for PM10 and PM2.5 in the Bay Area.

The remaining operational criteria pollutants, VOC, NOx, SOx and CO were estimated to demonstrate that, in addition to particulate matter, Rule 6-3 would reduce VOC, NOx, SOx and CO emissions. Table 3-10 illustrates the results.

**Table 3-10: Emission Reductions due to Curtailment, tons per year**

	<b>PM2.5</b>	<b>VOC</b>	<b>NOx</b>	<b>SOx</b>	<b>CO</b>
Wood Smoke Emissions	810	1300	200	19	6200
Emissions from Natural gas usage	1	1	10	0.1	4
Net Emission Reductions	810	1300	190	19	6200

### 3.2.3.2 Non-Criteria Pollutants

The project, proposed Rule 6-3, will reduce the emissions of toxic air contaminants. The proposed rule allows sale, transfer or installation of only EPA Phase II certified devices, these combust the unburned products of wood smoke, which include many TACs, in a more efficient manner than non-certified devices. Wood stoves or wood-burning fireplaces would be banned in newly constructed housing. Natural gas is a cleaner burning fuel than wood; therefore the installation or replacement of pre-EPA approved devices with natural gas appliances would reduce toxic emissions and prevent an increase in wood smoke emissions from new developments. Finally, the rule would prohibit wood burning on nights when the amount of particulate matter in ambient air would exceed 35 micrograms per cubic meter. This would reduce exposure of individuals to TACs associated with wood smoke. Rule 6-3 is expected to provide beneficial impacts on toxic air contaminants and related beneficial health impacts.

### 3.2.3.3 Greenhouse Gases

In general, GHG do not have human health effects like criteria pollutants. Rather, it is the increased accumulation of GHG in the earth's atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project. Proposed Regulation 6, Rule 3 includes a provision that would prohibit burning on a night when the concentration of particulate matter in ambient air was predicted to exceed 35  $\mu\text{g}/\text{meter}^3$ . To the extent that wood burning is used for heating, this could require the use of heat from other sources such as natural gas heaters on these curtailment nights. The NOP/IS suggested that the burning of fossil fuels such as natural gas rather than wood may increase greenhouse gas emissions. As explained below, there is some uncertainty about the GHG impacts of prohibiting wood burning on curtailment nights, but the most sophisticated life-cycle analyses of GHG emissions suggest that burning natural gas in relatively efficient furnaces produces lower GHG emissions than burning wood that has not been sustainably harvested.

Any analysis of GHG impacts must address a number of uncertainties and must rely on a variety of assumptions. For example, analysis of the use of wood as a fuel occasionally relies upon an assumption that wood burning is "carbon neutral," meaning that as trees are harvested for fuel, replacement trees sequester an equivalent amount of carbon dioxide so that, when measured over a period of time, there is no net increase in atmospheric carbon dioxide. However, more recent analyses of biofuels such as ethanol have suggested that the GHG emissions associated with their production and use may exceed GHG emissions from production and use of conventional fossil fuels when all

sources of GHG emissions – from land practices, to harvest, to transportation, to combustion – are included in the accounting.<sup>1</sup>

The primary determining factor in the GHG analysis for Rule 6-3 is whether burning wood is “carbon neutral,” and, if not, whether burning wood in fireplaces and woodstoves produces lower GHG emissions than burning natural gas in furnaces. As a reference point, the District calculated a worst case scenario of the annual CO<sub>2</sub> increase from switching from wood to natural gas if wood burning is assumed to be completely carbon neutral. Assuming 100% compliance with the rule, and assuming that everyone who switches to natural gas on a “no burn” night would not otherwise use natural gas for heat, the result would be a 31,900 metric ton annual increase in CO<sub>2</sub>. This figure would obviously be lower to the extent that there is less than 100% compliance or that a percentage of households were burning wood for ambiance and not for heat (the latter being a likely scenario for a large percentage of households).

Also for reference, the District compared this total carbon neutrality figure to the overall GHG inventory for the Bay Area and for the State. 31,900 metric tons is .03 % of the Bay Area total GHG inventory, and .007% of the total State GHG inventory. These percentages give some idea of the significance of a worst case GHG increase from 6-3 if carbon neutrality is assumed.

Although these figures may be useful reference points, available information indicates the carbon neutrality assumption is not valid for wood burning in the Bay Area. Since a switch from wood to natural gas on Rule 6-3 no-burn nights would increase GHG emissions only to the extent that either, (1) burning wood is carbon neutral (since burning natural gas is clearly not carbon neutral) or, (2) burning wood produces lower GHG emissions than burning natural gas, taking into account efficiency and other factors, and since neither is the case, it can safely be predicted that GHG emissions will not increase as a result of 6-3. In reaching this conclusion, the District reviewed available scientific literature and applied the most credible conclusions therein to information about the Bay Area obtained through published studies and data from a District-conducted survey.

In the winter of 2005 – 2006, a survey was conducted by a contractor to BAAQMD to estimate the amount and frequency of wood burning on winter nights in the Bay Area. The survey found that 4.5% of Bay Area households used (not just owned) wood stoves, and that 35.9% used fireplaces. Over the survey time period, conducted on days after cold winter evenings on which wood burning devices were used, the survey found that 45.3% of households that used wood stoves burned on the previous evening, and that 14.0% of fireplace users burned the previous evening. The survey also estimated a total number of logs burned, and found that, during the survey period, 319,115 logs were burned per day in fireplaces and 174,281 logs were burned per day in wood stoves.

---

<sup>1</sup> Fargione et al., “Land Clearing and the Biofuel Carbon Debt” *Science* 319, 1235 (2008); Searchinger et al., “Use of U.S. Croplands for Biofuels Increases Greenhouse Gas Emissions Through Emissions from Land Use Change” *Science* 319, 1238 (2008).

A limited number of studies address the GHG impacts of wood combustion. In general, earlier papers suggest that wood burning may be carbon neutral, while more recent papers qualify that assessment and either limit the CO<sub>2</sub> “credit” from sequestration by replacement trees or limit the circumstances under which wood combustion can be said to have GHG benefits over other fuels.

In a 1998 paper prepared for a U.S. EPA/Air and Waste Management Association conference, personnel from the Hearth Products Association, EPA, and OMNI-Test Laboratories, Inc., which tests appliances for the hearth products industry, summarized air quality impacts of various residential space heating options.<sup>2</sup> In reviewing GHG impacts, the authors state that “a reasonable estimate of the steady state condition produced by standard wood harvesting techniques is that 40% of the carbon produced by RWC is in the form of fixed carbon.” By this, the authors meant that calculated CO<sub>2</sub> emissions for RWC (residential wood combustion) should be reduced by 40%, because young trees replace harvested trees and sequester an amount of carbon equal to 40% of the carbon emitted from burning the harvested wood. For their 40% figure, the authors cite a 1990 paper in *Science*<sup>3</sup> and a 1993 AWMA paper<sup>4</sup>. The 1990 *Science* paper concludes that conversion of old-growth forests to young fast-growing forests will not decrease atmospheric carbon dioxide because timber harvest reduces on-site carbon storage and does not approach old-growth storage capacity for at least 200 years. The 1993 AWMA paper states that wood burning for residential heating causes no net increase in atmospheric carbon dioxide if wood is sustainably harvested from properly-managed forests.

A much more sophisticated study prepared in 2003 for the Australian Greenhouse Office and Environment Australia concludes that burning wood for residential heating reduces GHG emissions relative to natural gas, but only under the scenarios examined in the study, which all involved sustainable firewood production systems. The three production systems were (1) collecting dead and fallen wood from remnant woodlands, (2) harvesting in a sustainably-managed native forest, and (3) harvesting in a new plantation planted on former agricultural land. No scenario involved production of wood through land clearing activities. Most importantly for present purposes, the study included a sensitivity analysis showing that, for wood collected from remnant woodlands, burning wood in an open fireplace has higher GHG emissions than burning natural gas. Specifically, the study concluded that burning wood from remnant woodlands in an open fireplace produces emissions of 0.70 kg CO<sub>2</sub>/kW-hr, which is more than double the

---

<sup>2</sup> Houck, Crouch, Keithley, McCrillis, and Tieg; Air Emissions from Residential Heating: The Wood Heating Option Put Into Environmental Perspective; The Proceedings of a US EPA and Air and Waste Management Association Conference: Emission Inventory: Living in a Global Environment,; v1, 373-384; 1998.

<sup>3</sup> M.E. Harmon, W.K. Ferrell, and J.E. Franklin, “Effects on Carbon Storage of Conversion of Old-Growth Forests to Young Forests,” *Science* 247, 699 (1990).

<sup>4</sup> J.F. Gulland, O.Q. Hendrickson, “Residential Wood Heating: the Forests, the Atmosphere, and the Public Consciousness” Paper 93-RP-136.02 presented at the 86th Annual Meeting of the Air and Waste Management Association (1993).

emissions from producing heat from natural gas, for which emissions are 0.31 kg CO<sub>2</sub> /kW-hr.

Based on dealer advertising, the primary firewood sold in the San Francisco Bay Area is oak. Oak is both the most prevalent source of firewood and also the most desirable, due to burn qualities. Bay Area dealers often advertise tree service companies as the primary source of the wood. Oak has been harvested in significant quantities from California's remnant woodlands beginning with the advent of ranching in California. Oak woodlands have been reduced by about half since the 1800's.<sup>5</sup> From 1945 to 1973, most of the loss came from land clearing to support livestock production.<sup>6</sup> Since 1973, woodland loss is attributable to urban growth, firewood harvesting, range clearing, and conversion to intensive agriculture.<sup>7</sup> Between 1945 and 1985, oaks were cleared from 480,000 hectares in California.<sup>8</sup> A more recent threat to the oak woodlands has been the conversion of native habitat to vineyards.<sup>9</sup> This is occurring throughout Northern California on the periphery of the San Francisco Bay Area and in the foothills to the east of the Central Valley. In addition, the loss of oaks through Sudden Oak Death is primarily occurring in the San Francisco Bay Area, as fourteen counties are affected, including all nine Bay Area counties.<sup>10</sup>

Based on the Australian study discussed above and the available information about firewood used in the Bay Area, the imposition of no-burn requirements in the Bay Area is not expected to result in an increase in GHG emissions. Bay Area survey data shows that approximately two-thirds of the wood burned in the Bay Area is burned in fireplaces. According to the Australian study, GHG emissions from fireplace burning of wood gathered sustainably from remnant woodlands are more than double the GHG emissions from burning natural gas. Because oak firewood used in the San Francisco Bay Area comes largely from land clearing activities, GHG emissions from Bay Area wood burning would be expected to be even higher than those from the remnant woodland production system analyzed in the Australian study. This result should not be surprising because when a tree is harvested and not replaced, carbon dioxide is generated by burning the wood and, at the same time, an ongoing means of sequestering carbon is removed.

If no assumptions are made regarding carbon sequestration by trees, and wood and natural gas are compared purely on the basis of carbon dioxide produced per unit of heat

---

<sup>5</sup> Standiford et al., "The Bioeconomics of Mediterranean Oak Woodlands: Issues in Conservation Policy" Paper presented at the XII World Forestry Congress, Québec City, Canada (2003).

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> C. Bolsinger, "The Hardwoods of California's Timberlands, Woodlands, and Savannas. U.S. Forest Service Resource Bulletin PNW-RB-148 (1988).

<sup>9</sup> A.M. Merenlender, C.N. Brooks, G.A. Giusti "Policy Analysis Related to the Conversion of Native Habitat to Vineyard: Sonoma County's Vineyard Erosion and Sediment Control Ordinance as a Case Study" (2000) Available from the University of California Integrated Hardwood Range Management Program at [http://danr.ucop.edu/ihrmp/policy\\_paper.pdf](http://danr.ucop.edu/ihrmp/policy_paper.pdf).

<sup>10</sup> California Oak Mortality Task Force, Map: "Distribution of Sudden Oak Death as of February 14, 2008" (2008) Available from <http://www.suddenoakdeath.org/html/maps.html>.

energy delivered, burning natural gas on no-burn nights would produce lower GHG emissions than burning wood. Using the survey data, Table 3-11, below, compares the GHG emissions from wood-burning devices to the GHG emission that would be produced if the same amount of heat was produced by burning natural gas, as would be required on no burn nights. GHG emissions are reduced by a total of over 100,000 metric tons per year.

**Table 3-11: GHG Emissions Direct Comparison, Wood Heat Replaced by Natural Gas Heat**

Heat Value of Fuel, per curtailment day	GHG emissions; metric tons/yr
Wood; fireplaces, 2137.4 MM Btu useful heat	78,065
Wood; mfg. logs, 153.2 MM Btu useful heat	11,212
Wood, stoves, 8564.2 MM Btu useful heat	40,933
Wood; total, 3145 MM Btu useful heat input	130,210
Natural Gas; 3145 MM Btu useful heat input	29,419
Difference	(100,791)

Assumptions

- Efficiencies. This analysis uses a 10% heating efficiency factor for fireplaces, a 70% heating efficiency factor for wood stoves, and an 80% heating efficiency factor for a natural gas heater.
- Combustion efficiency. For these GHG emissions calculations, it is assumed that CO<sub>2</sub> emissions are the only GHG emissions from each type of combustion device.
- Number of no burn nights. Over the past five years, the average number of no burn nights was 17.1.
- Type of wood burned. The emissions estimates replace the Btu value of wood with natural gas combusted to get an equivalent Btu value. The Btu values used are based on the Btu value of red oak.

Even if one were to assume that emissions from wood burning should be reduced by 40% to account for carbon sequestration by trees, despite the lack of evidence to support such an assumption for the Bay Area, GHG emissions from burning wood would still be significantly higher than GHG emissions from burning natural gas to generate the same heat.

**3.2.4 MITIGATION MEASURES**

No significant adverse air quality impacts are anticipated from adoption of proposed Regulation 6, Rule 3: Wood-Burning Devices. No mitigation measures are required.

### **3.2.5 CUMULATIVE AIR QUALITY IMPACTS**

The project, proposed Regulation 6, Rule 3: Wood-Burning Devices, does not have air quality impacts that are individually less than significant, but cumulatively significant. Adoption of the proposed rule will reduce emissions of particulate matter and other criteria air pollutants, toxic air contaminants and greenhouse gases.

### **3.2.6 CUMULATIVE MITIGATION MEASURES**

No cumulatively significant adverse air quality impacts are anticipated from adoption of proposed Regulation 6, Rule 3: Wood-Burning Devices. No mitigation measures are required.

## **3.3 CONCLUSION**

The project, proposed Regulation 6, Rule 3: Wood-Burning Devices, will have considerable environmental benefits. These include a reduction of peak concentrations of PM<sub>2.5</sub>, as well as a reduction in ozone forming volatile organic compounds, oxides of nitrogen, carbon monoxide, sulfur dioxide, and non-criteria pollutants, including toxic and carcinogenic compounds. Based on this analysis, an increase in greenhouse gas emissions is not anticipated.



## **CHAPTER 4**

---

### **ALTERNATIVES**

Discussion

## **4.0 ALTERNATIVES**

### **4.1 DISCUSSION**

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR and the Initial Study (see Appendix A), the proposed new rule is not expected to result in significant impacts to any environmental resources including aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities service systems. Because no significant impacts have been identified for the proposed project, alternatives are not required to be analyzed in this EIR. The requirement to develop alternatives under CEQA Guidelines §15126.6 has been satisfied because no significant adverse impacts were identified for the proposed project. No further discussion of alternatives is required for this EIR.

## **CHAPTER 5**

---

### **OTHER CEQA TOPICS**

Relationship Between Short-Term and Long-Term  
Productivity  
Significant Irreversible Environmental Changes  
Growth-Inducing Impacts

## **5.0 OTHER CEQA TOPICS**

### **5.1 RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM PRODUCTIVITY**

An important consideration when analyzing the effects of a proposed project is whether it will result in short-term environmental benefits to the detriment of achieving long-term goals or maximizing productivity of these resources. Implementing Rule 6-3 is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. The purpose of the proposed rule is to reduce emissions of particulate matter and visible emissions, particularly on winter nights when particulate matter concentrations could exceed the national health-based air quality standard for fine particulate matter with a diameter less than 2.5 microns. The proposed rule is expected to control air pollution from wood-burning stoves, fireplaces, and heaters, including wood pellet stoves. By reducing particulate matter and visible emissions, human exposure to air pollutants would also be reduced, providing long-term health benefits.

Implementing Rule 6-3 would not narrow the range of beneficial uses of the environment. Of the potential environmental impacts discussed in Chapter 3, no significant impacts to any environmental resource are expected. The beneficial air quality and health impacts associated with implementation of Rule 6-3 are expected to far outweigh any potential increase in CO<sub>2</sub> emissions. Existing programs are expected to provide long-term CO<sub>2</sub> emission decreases. Because no short-term environmental benefits are expected at the expense of long-term environmental goals being achieved, there is no justification for delaying the proposed action. The proposed project should be implemented now in order to meet the requirements of Senate Bill 656 (SB 656, Sher), adopted in 2003, as the District was required to develop a Particulate Matter Implementation Schedule in order to make progress toward attaining state and federal particulate matter standards. The District's wood burning program was identified in the District's Particulate Matter Implementation Schedule as one of the measures for enhancement and amendment. Rule 6-3 responds to that commitment. No short-term benefits at the expense of long-term impacts have been identified. In fact, the proposed project is expected to result in long-term emission reductions and long-term public health benefits.

### **5.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES**

CEQA requires an EIR to discuss significant irreversible environmental changes which would result from a proposed action should it be implemented. Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting undeveloped land to urban uses), or enduring environmental damage due to an accident.

Implementation of the proposed rule is not expected to result in significant irreversible adverse environmental changes. Of the potential environmental impacts discussed in Chapter 3, no significant impacts to any environmental resource are expected. Air quality impacts are expected to be less than significant as implementation of proposed rule will result in overall emission reductions of PM10 and PM2.5. The rules would also result in a decrease in other criteria pollutants, toxic air contaminants and greenhouse gases.

Proposed Rule 6-3 is expected to result in long-term benefits associated with improved air quality even though the use of natural gas in the Bay Area is expected to increase. The project would result in reduced emissions of all pollutants, thereby improving air quality and related public health.

### **5.3 GROWTH-INDUCING IMPACTS**

A growth-inducing impact is defined as the “ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.” Growth-inducing impacts can generally be characterized in three ways. In the first instance, a project is located in an isolated area and brings with it sufficient urban infrastructure to result in development pressure being placed on the intervening and surrounding land. This type of induced growth leads to conversion of adjacent acreage to higher intensity uses because the adjacent land becomes more conducive to development and, therefore, more valuable because of the availability of the extended infrastructure.

A second type of growth-inducing impact is produced when a large project, relative to the surrounding community or area, affects the surrounding community by facilitating and indirectly promoting further community growth. The additional growth is not necessarily adjacent to the site or of the same land use type as the project itself. A project of sufficient magnitude can initiate a growth cycle in the community that could alter a community’s size and character significantly.

A third and more subtle type of growth-inducing impact occurs when a new type of development is allowed in an area, which then subsequently establishes a precedent for additional development of a similar character (e.g., a new university is developed which leads to additional educational facilities, research facilities and companies, housing, commercial centers, etc.)

None of the above scenarios characterize the project in question. Rule 6-3 will control emissions from wood-burning devices and no new development would be required as part of the proposed new rule. The proposed project is part of the Particulate Matter Implementation Schedule developed by the District to comply with SB656 to accommodate making progress toward attainment of state and federal particulate matter standards. The proposed project would not change jurisdictional authority or responsibility concerning land use or property issues (Section 40716 of the California Health and Safety Code) and, therefore, is not considered to be growth-inducing.

## **CHAPTER 6**

---

### **REFERENCES**

## 6.0 REFERENCES

- BAAQMD, 1998. BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans, Revised December 1999.
- BAAQMD, 2005. 2005 Ozone Strategy.
- BAAQMD, 2005, Staff Report, Particulate Matter Implementation Schedule, November, 2005.
- BAAQMD, 2007. Toxic Air Contaminant Control Program Annual Report 2003 Volume I. August 2007.
- BAAQMD, 2007. Workshop Report, Wood Smoke Reduction Program, Proposed Regulation 6, Rule 3 to Control Particulate Matter and Visible Emissions from Wood-burning Devices. November 2007.
- BAAQMD, 2008. Sources of Fine Particles, Technical Report, April, 2008.
- Bolsinger, "The Hardwoods of California's Timberlands, Woodlands, and Savannas," US Forest Service Resource Bulletin PNW-RB-148, 1988.
- California Air Pollution Control Officer's Association, 2008. CEQA and Climate Change, January 2008.
- California Air Resources Board (CARB), 2007a. Initial Statement of Reasons for Rulemaking, Proposed Regulation for Mandatory Reporting of Greenhouse Gas Emissions Pursuant to the California Global Warming Solutions Act of 2006 (Assembly Bill 32). Planning and Technical Support Division Emission Inventory Branch, October 19, 2007
- California Oak Mortality Task Force, Map: "Distribution of Sudden Oak Death as of February, 2008", 2008; <http://www.suddenoakdeath.org/html/maps.html>.
- CARB, 2007. Draft California Greenhouse Inventory by IPCC Category, August 2007. [http://www.arb.ca.gov/cc/ccei/inventory/tables/rpt\\_inventory\\_ipcc\\_sum\\_2007-11-19.pdf](http://www.arb.ca.gov/cc/ccei/inventory/tables/rpt_inventory_ipcc_sum_2007-11-19.pdf)
- CARB, 2008. 2007 California Almanac of Emissions and Air Quality, CARB, 2008.
- Fargione, et al., "Land Clearing and the Biofuel Carbon Debt" Science 319, 1235, 2008,
- Gulland and Hendrickson, "Residential Wood Heating: the Forests, the Atmosphere, and the Public Consciousness" paper 93-RP-136.02 presented at the 86<sup>th</sup> Annual Meeting of the Air And Waste Management Association, 1993

Harmon, Ferrell, and Franklin, “Effects on carbon Storage of Conversion of Old-Growth Forests to Young Forests,” *Science* 247, 699; 1990

Houck, Crouch, Keithley, McCrillis, and Tieg: Air Emissions from Residential Heating: The Wood Heating Option Put Into Environmental Perspective; The Proceedings of a US EPA and Air And Waste Management Association Conference: Emission Inventory: Living in a Global Environment; v1, 373-384; 1998.

Magliano, Karen, Phillip Roth, Charles Blanchard, Steven Reynolds, Steve Ziman, and Rob DeMandel. California Regional PM10/PM2.5 Air Quality Study Objectives and Associated Data Analysis and Modeling Approaches. February 5, 1999.

Merelender, Brooks and Giusti, “Policy Analysis Related to the Conversion of Native Habitat to Vineyard: Sonoma County’s Vineyard Erosion and Sediment Control Ordinance as a Case Study,” 2000, University of California Integrated Hardwood Range Management Program; [http://danr.ucop.edu/ihrmp/policy\\_paper.pdf](http://danr.ucop.edu/ihrmp/policy_paper.pdf).

Paul, Booth, Elliot, Jovanovic, Polglase and Kirshbaum, “Life Cycle Assessment of the Greenhouse Gas Emissions From Domestic Woodheating,” CSIRO Forestry and Forest Products, Prepared for the Australian Greenhouse Office and Environment Australia, 2003.

Searchinger, et al., “Use of U.S. Croplands for Biofuels Increases Greenhouse Gas Emissions Through Emissions from Land Use Change” *Science* 319, 1238, 2008.

Standiford, et al., “The Bioeconomics of Mediterranean Oak Woodlands: Issues in Conservation Policy” Paper presented at the XII World Forestry Conference, Quebec City, Canada, 2003.

U.S. EPA, 2007. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, <http://www.epa.gov/climatechange/emissions/downloads06/07CR.pdf>, April 15, 2007.

## **6.2 ORGANIZATIONS AND PERSONS CONSULTED**

The CEQA statues and Guidelines require that organizations and persons consulted be provided in the EIR. A number of organizations, state and local agencies, and private industry have been consulted. The following organizations and persons have provided input into this document.

### **Organizations**

California Air Resources Board  
Bay Area Air Quality Management District  
South Coast Air Quality Management District



**List of Environmental Impact Report Preparers**

Bay Area Air Quality Management District  
San Francisco, California

Environmental Audit, Inc.  
Placentia, California

## **CHAPTER 7**

---

### **ACRONYMS**

ACRONYMS

ABBREVIATION	DESCRIPTION
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AB2588	Air Toxic "Hot Spots" Information and Assessment Act
AB32	California's Global Warming Solutions Act of 2006
ATCM	Airborne Toxic Control Measure
ATHS	Air Toxics Hot Spots Program
BAAQMD	Bay Area Air Quality Management District
Btu/cord	British thermal units per cord
CalEPA	California State Environmental Protection Agency
CARB	California Air Resources Board
CAT	Climate Action Team
CEQA	California Environmental Quality Act
CH <sub>4</sub>	Methane
CHP	California Highway Patrol
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CPUC	California Public Utilities Commission
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EIR	Environmental Impact Report
EPS	Emissions Performance Standard
GHG	Greenhouse Gases
g/hr	grams per hour
H <sub>2</sub> SO <sub>4</sub>	Sulfuric Acid
HFCs	Haloalkanes
HNO <sub>3</sub>	Nitric Acid
HWCL	Hazardous Waste Control Law
LPG	Liquefied petroleum gas
MACT	maximum achievable control technology
MEI	maximum exposed individual
MW-hr	Megawatt-hour
N <sub>2</sub>	Nitrogen
N <sub>2</sub> O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NFC	National Fire Codes
NO	Nitric Oxide
NO <sub>2</sub>	Nitrogen Dioxide
NOP	Notice of Preparation
NOP/IS	Notice of Preparation/Initial Study
NOx	Nitrogen Oxide
NSR	New Source Review

O <sub>2</sub>	Oxygen
O <sub>3</sub>	Ozone
OES	Office of Emergency Services
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
PM <sub>2.5</sub>	particulate matter less than 2.5 microns equivalent aerodynamic diameter
PM <sub>10</sub>	particulate matter less than 10 microns equivalent aerodynamic diameter
ppb	parts per billion
pphm	parts per hundred million
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
SB97	California Senate Bill 97
SB 656	Senate Bill 656
SCAQMD	South Coast Air Quality Management District
SF <sub>6</sub>	Sulfur Hexafluoride
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	sulfur oxide
STAT	Spare the Air Tonight
TACs	toxic air contaminants
TPD	Tons per Day
TPY	Tons per Year
U.S. EPA	United States Environmental Protection Agency
ug/m <sup>3</sup>	micrograms per cubic meter
VOC	volatile organic compounds

## **APPENDIX A**

---

**NOTICE OF PREPARATION AND INITIAL STUDY ON THE DRAFT  
ENVIRONMENTAL IMPACT REPORT.**



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

## California Environmental Quality Act

### NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT FOR ADOPTION OF DISTRICT REGULATION 6: PARTICULATE MATTER, RULE 3: WOOD-BURNING DEVICES

Interested Agencies, Organizations and Individuals:

**Subject:** Notice is hereby given that the Bay Area Air Quality Management District (Bay Area AQMD or District) will be the lead agency and will prepare an Environmental Impact Report (EIR) in connection with the project described in this notice. This Notice of Preparation is being prepared pursuant to California Public Resources Code § 21080.4 and CEQA Guidelines Section 15082.

**Project Title:** Bay Area AQMD proposed Regulation 6: Particulate Matter, Rule 3: Wood-Burning Devices.

**Project Location:** The rule will apply within the Bay Area AQMD, which includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma counties.

**Project Description:** The District is proposing to adopt a new rule, Regulation 6: Particulate Matter, Rule 3: Wood-Burning Devices. The proposed rule will apply to residences and commercial establishments (hotels, restaurant, etc.) with wood-burning devices. The rule will limit visible emissions to 20% opacity, except for a start-up period; prohibit the burning of garbage, treated or unseasoned wood, plastics or other non-wood products; require labeling of the health hazards of breathing particulate matter on firewood and manufactured solid fuel products sold in the Bay Area and provide instructions on how to find information on the burn status of any day; require seasoned wood sold in the Bay Area to have a moisture content of 20% or less and require sellers to provide seasoning instructions if unseasoned wood is sold; prohibit the sale, transfer or installation of wood-burning devices unless they are EPA Phase II certified or wood pellet stoves; allow wood-burning devices only if they are EPA Phase II certified or pellet stoves in new construction; and prohibit burning under one of two options during days when the District predicts that the concentration of fine particulate matter (particulate matter less than 2.5 microns in diameter) in ambient air would exceed 35 micrograms per cubic meter. Under the first option, no burning in any wood-burning device would be allowed. Under the second option, burning would only be allowed in EPA Phase II certified wood-burning devices or pellet stoves.

In addition, the District is proposing to amend Regulation 5: Open Burning and Regulation 1: General Provisions and Definitions. The amendment to Regulation 5 would prohibit outdoor recreational fires when the concentration of fine particulate matter standard was predicted to exceed 35 micrograms per cubic meter. The amendment to Regulation 1 deletes an exclusion from District standards for residential heating, enabling adoption of the standards in proposed Regulation 6, Rule 3.

**Probable Environmental Impacts:** Adoption of a new rule to limit particulate matter emissions from wood-burning devices is intended to and expected to benefit public health and the environment. However, the District has chosen to prepare an EIR to ensure a comprehensive evaluation of any potential impacts. Attached to this notice is an Initial Study. The Initial Study outlines the areas of potential environmental impact that will be further reviewed in the draft Environmental Impact Report.

**Response:** This notice provides information on the above project and provides you an opportunity to submit comments on potential environmental effects that should be considered in the EIR. If the proposed project has no bearing on you or your agency, no action on your part is necessary. Due to the time limits mandated by State law, your response must be sent at the earliest possible date but **not later than 30 days** after receipt of this notice. If you or your agency wishes to submit comments, they may be sent to Eric Pop, via the contact information below.

## Appendix A - Notice of Preparation and Initial Study

**Eric Pop, Air Quality Specialist**  
**Bay Area Air Quality Management District**  
**939 Ellis Street**  
**San Francisco, CA 94109**  
**Phone: (415) 749-5172 Fax: (415) 928-0338**  
**Email: [epop@baaqmd.gov](mailto:epop@baaqmd.gov)**  
**Date: March 10, 2008**

## Chapter 1

### Description of the Proposed Rule

#### Prior Control Efforts in the Bay Area

The Bay Area Air Quality Management District (District) is proposing adoption of Regulation 6, Rule 3 (Rule 6-3): Wood-Burning Devices. This proposed rule would control air pollution from wood-burning stoves, fireplaces, heaters, including wood pellet stoves. The District proposes adoption of Regulation 6, Rule 3 to reduce emissions of fine particulate matter (PM<sub>2.5</sub>, or particulate matter with a diameter less than 2.5 microns), particularly on winter nights when fine particulate matter concentrations could exceed 35 µ/m<sup>3</sup> (micrograms/cubic meter), which is the basis for the national health-based air quality standard. The national 24-hour standard for fine particulate matter in ambient air was lowered from 65 µ/m<sup>3</sup> to 35 µ/m<sup>3</sup> in December, 2006.

Currently, fireplaces and wood stoves used to heat residences are exempt from District rules by Regulation 1, Section 110.4. However, from time to time the District receives air pollution complaints about residential wood-burning devices, such as excessive smoke and odor. Because the District's regulations of general applicability, such as Regulation 6: *Particular Matter and Visible Emissions*, and Regulation 7: *Odorous Substances*, and the public nuisance standard in Regulation 1 do not apply, the District has been responding to such complaints with informational literature advising residents of the dangers of particulate matter and how to burn with a minimum of smoke.

The District also has a voluntary program to minimize particulate matter emissions from wood-burning devices, Spare the Air Tonight (STAT). The STAT program asks residents, via e-mail, the District website and press releases to radio and TV, not to burn on days when the concentration of PM<sub>2.5</sub> in ambient air is predicted to exceed 35 µ/m<sup>3</sup>. The STAT season runs from mid-November through mid-February, and has been active since 1991. Typically, there are between 20 and 30 STAT nights. The 2007-2008 season was a-typical because there were only six. During the STAT season, the District conducts random telephone surveys to gauge the success of the voluntary program, the public's practices for burning to refine the emission inventory, and public attitudes and behaviors associated with wood burning.

In addition, the District has promoted a model ordinance to cities and counties that contains various elements that can reduce particulate matter from wood smoke. The model ordinance serves as a guidance document for cities and counties that wish to regulate sources of particulate matter in their communities. The model ordinance includes options for mandatory burning curtailments on STAT nights, for requiring that new or re-modeled homes contain only EPA Phase II certified devices, for prohibiting gas to wood heating conversion and for limiting fuel that can be burned. Enforcement of the model wood smoke ordinance typically occurs through the permit process at local



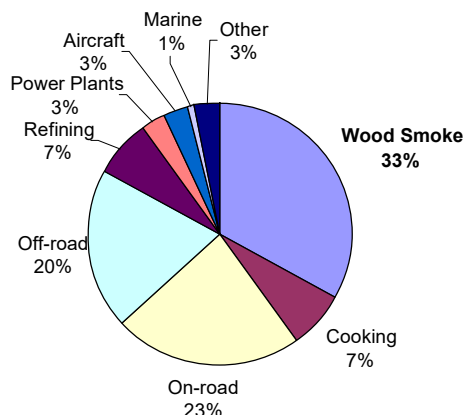
building departments. Residents must provide documentation that the device to be installed is allowed by the ordinance. To date, 41 Bay Area cities and eight counties have adopted aspects of this model ordinance, including a mix of voluntary and mandatory standards.

The District also co-sponsored and managed a financial incentive, or “wood stove change-out” program in Santa Clara County as part of an air quality mitigation program required by the California Energy Commission. Rebates were offered to residents to remove non-EPA-certified wood-burning devices, install only EPA-certified devices, or to retrofit wood-burning fireplaces with natural gas fireplaces. The District’s Cleaner Burning Technology Incentives Program offered a similar District-wide incentive program in 2007.

### Harmful Effects of Wood Smoke

Wood-burning devices generate particulate matter. Combustion of wood also creates carbon dioxide, water vapor, carbon monoxide and volatile organic compounds, including toxic compounds. Partial or incomplete combustion, or burning wood that is not seasoned and dry, or burning garbage or other materials generates more particulate matter, carbon monoxide, and increases toxic compounds.

Residential wood combustion is an important contributor to ambient fine particle levels in the United States. District staff has identified wood smoke as the single greatest contributor on wintertime peak days (33%) to PM<sub>2.5</sub> in the Bay Area, as shown in Figure 2-1.



**Figure 2-1.** PM<sub>2.5</sub> Concentration on Peak Days by Constituent in the Bay Area.

Other studies find results and trends that support emission inventory estimates derived from the District data. The California Air Resources Board found that residential wood combustion makes up 20 percent to 35 percent of wintertime PM.

To estimate the amount of PM coming from wood-burning devices, including fireplaces, District staff used data from survey sample results from Bay Area residents. These results were then correlated with projected demographic trends from the Association of

Bay Area Governments (ABAG), which were based on U.S. Census data, and used to arrive at the estimated number of devices. These data, along with an annual through-put (fuel load), also derived from survey results, and an emission factor were then used to generate a PM<sub>10</sub> estimate for each county in the Bay Area. These data are summarized in Table 2-1 in tons per day (tpd) and tons per year (tpy), for both PM<sub>10</sub> (particulate matter 10 microns and below in diameter) and PM<sub>2.5</sub>.

County	Wood Stove PM <sub>10</sub> (tpd)	Fireplace PM <sub>10</sub> (tpd)	Wood Stove PM <sub>2.5</sub> (tpd)	Fireplace PM <sub>2.5</sub> (tpd)
Alameda	0.03	2.28	0.03	2.19
Contra Costa	0.76	4.32	0.73	4.15
Marin	1.03	0.37	0.99	0.36
Napa	0.33	0.41	0.32	0.39
San Francisco	0.03	0.28	0.03	0.27
San Mateo	0.38	0.70	0.36	0.67
Santa Clara	0.65	3.11	0.62	2.99
Solano	0.05	0.89	0.05	0.85
Sonoma	1.27	1.43	1.22	1.37
<b>Total Emissions Bay Area (tpd)</b>	<b>4.54</b>	<b>13.80</b>	<b>4.36</b>	<b>13.25</b>
<b>Total Emissions Bay Area (tpy)</b>	<b>1657</b>	<b>5037</b>	<b>1591</b>	<b>4836</b>

**Table 2-1.** Summary of PM emissions from wood-burning devices by county.

Because the category of PM<sub>10</sub> also includes PM<sub>2.5</sub>, a large portion of PM<sub>10</sub> particles are also PM<sub>2.5</sub> particles. Therefore, the majority of PM from wood smoke are fine particles. It is these fine particles that are of greatest concern to public health.

**Objectives**

The objective of Rule 6-3 is to reduce particulate matter and visible emissions from wood-burning devices and thereby reduce ambient levels of particulate matter in the Bay Area, and to reduce wintertime peak concentrations, with the goal of attaining the federal PM<sub>2.5</sub> standard. The Bay Area is also not in attainment with the State particulate matter standards, so further reductions in emissions of PM are needed for that purpose as well.

The Bay Area attains the federal annual PM<sub>10</sub> (particulate matter of less than 10 microns in diameter) standard, but is not in attainment of the California annual PM<sub>10</sub> or PM<sub>2.5</sub> or the California 24-hour PM<sub>10</sub> standard. The Bay Area is unclassified for the national 24-hour PM<sub>10</sub> and new 24-hour PM<sub>2.5</sub> standard.

The BAAQMD is not required to produce an attainment plan for particulate matter. However, under the requirements of Senate Bill 656 (SB 656, Sher), adopted in 2003, the District was required to develop a Particulate Matter Implementation Schedule in order to make progress toward attaining state and federal PM standards. That plan was adopted in November, 2005. The District’s wood burning program was identified in the District’s PM Implementation Schedule as one of the measures for enhancement and amendment. Rule 6-3 responds to that commitment.

## Proposed Rule

The District is proposing Regulation 6, Rule 3 to reduce particulate matter and visible emissions from wood-burning devices in order to reduce ambient levels of particulate matter in the Bay Area, and to reduce wintertime peak concentrations to attain the national PM<sub>2.5</sub> standard.

**Visible Emissions:** Proposed Rule 6-3 would limit visible emissions from wood-burning devices, except 6 minutes during any hour period, to 20% visible emissions (equivalent to 1 on a Ringelmann Scale), except for 6 minutes during any hour. This opacity limit would not apply during a 20 minute start-up period for any wood fire. This opacity standard is required of other District operations from stationary sources, including dust from construction sites and any other regulated source. Failure to meet a visible emissions standard is indicative of poor ventilation to a fire, or poorly seasoned or wet wood. Based on District inspection staff observations, this standard is not difficult to meet for properly maintained and operated fireplaces and wood stoves.

**Prohibit Burning of Garbage:** Proposed Rule 6-3 would prohibit the burning of garbage, treated wood, non-seasoned wood, used or contaminated wood pallets, plastic products, rubber products, waste petroleum products, paints and paint solvents, coal, animal carcasses, glossy and/or colored paper, salt water driftwood, particle board, and any material not intended by a manufacturer for use as a fuel in a wood-burning device at any time. These materials produce volatile organic compounds, particulate matter and toxic compounds.

**Labeling:** Proposed Rule 6-3 would require a label be placed on firewood for sale, including manufactured wood products such as artificial logs and wood pellets. The label would address the health impacts from burning wood and how to find out when burning is prohibited. In addition, the label would have information on how to find out if burning is allowed on any given day. Unseasoned wood (moisture content of greater than 20%) would be required to be labeled as such and contain a notification that burning unseasoned wood is not allowed and provide instructions for seasoning.

**Seasoned wood:** Proposed Rule 6-3 would require that wood burned in a wood-burning device must be seasoned, meaning that it must have a moisture content of 20% or less. Only seasoned wood can be burned in a wood burning device. Unseasoned firewood may be sold, but must include a warning that it is not legal to burn before seasoning and instructions must be provided for seasoning.

**Sale, transfer or installation:** Federal law already requires newly manufactured wood stoves to meet EPA Phase II certification standards. Proposed Rule 6-3 would require that wood stoves sold, transferred or installed in the District meet these standards. Stoves sold as part of a house or other real estate transaction would not be affected by this prohibition.

**New Construction:** Proposed Rule 6-3 would allow only EPA certified wood-burning devices or pellet stoves in new construction. This would, among other things, prohibit conventional wood-burning fireplaces in new housing developments.

**Burning Curtailment:** Proposed Rule 6-3 would require one of two options that will limit the ability to burn on STAT nights, defined as a night when the ambient concentration of particulate matter is forecast to exceed  $35 \mu/m^3$ . Option 1 would not allow any burning in a wood-burning device on STAT nights. Option 2 would allow burning in EPA Phase II certified stoves and pellet stoves on STAT nights, but not allow the use of other conventional fireplaces and non-EPA certified stoves. An exemption would be provided for either option if wood burning was the only source of heat for a home. This initial study evaluates both options.

Proposed Regulation 6, Rule 3 is intended to be considered by the Bay Area Air Quality Management District Board of Directors in conjunction with proposed amendments to District Regulation 1: General Provisions and Definitions and Regulation 5: Open Burning. The purpose of the amendments to the Regulation 1 is to remove an exclusion from District regulations for fires used for residential heating. The purpose of the amendment to Regulation 5 is to remove an exemption for outdoor recreational fires on proposed curtailment days. These amendments, however, do not create any potential environmental impacts beyond those discussed herein. This Regulation 6, Rule 3 analysis discusses the potential environmental impacts of the proposed rule with these adjunctive amendments.

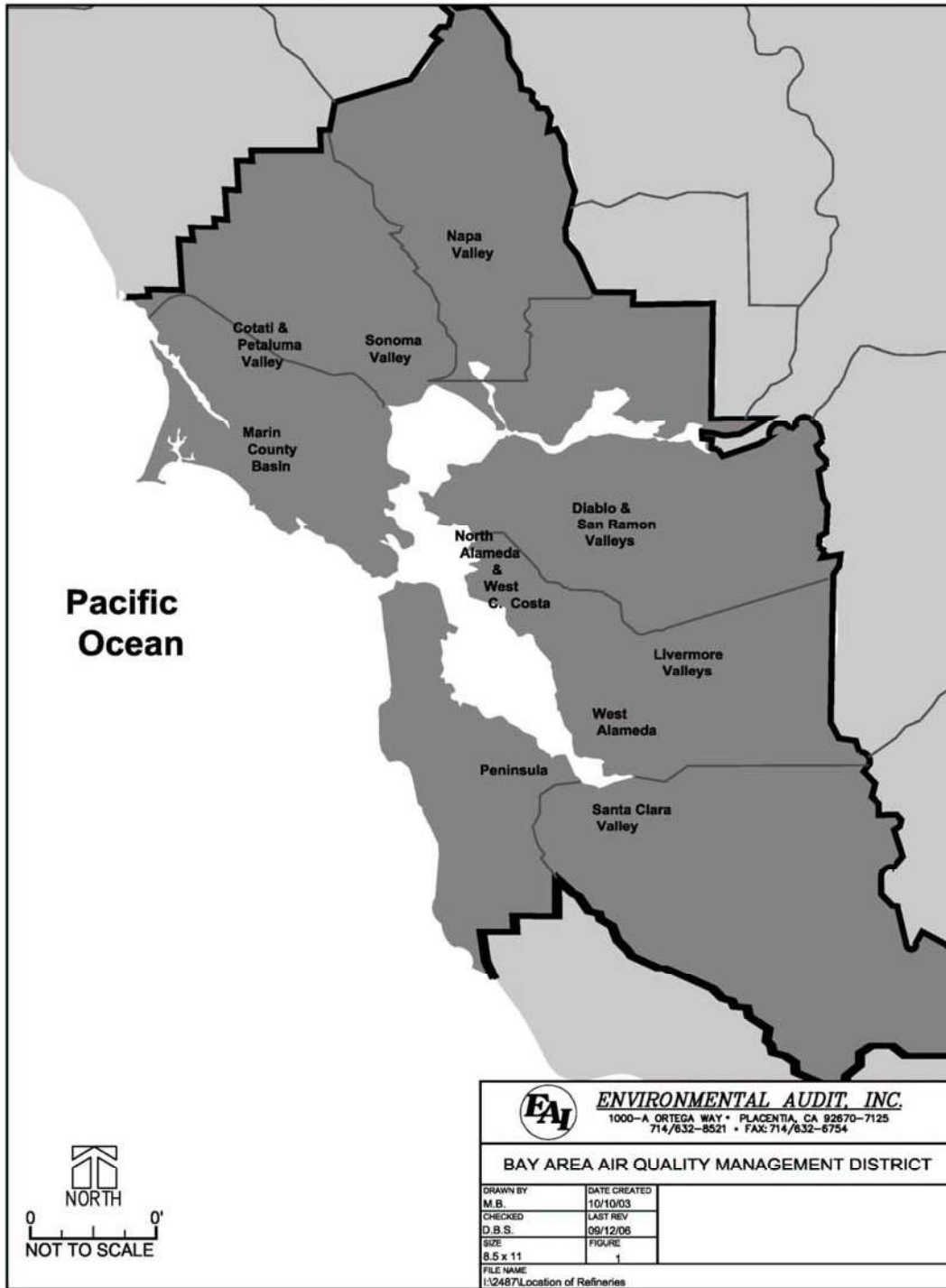
### Affected Area

The proposed rule amendments would apply to residences and commercial businesses (hotels, restaurants, etc. with a fireplace or wood-burning device) within the BAAQMD jurisdiction. The BAAQMD jurisdiction includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma counties (approximately 5,600 square miles). The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys, and bays.

The facilities affected by the proposed rule amendments are located within the jurisdiction of the Bay Area Air Quality Management District (see Figure 1).

M:\DBS\2519\2519-R6R2Ch2-ProjDesc.doc

# Appendix A - Notice of Preparation and Initial Study



## Chapter 2 Environmental Checklist

### ENVIRONMENTAL CHECKLIST FORM

- 1. Project Title:** Bay Area Air Quality Management District (BAAQMD)  
Proposed New Regulation 6, “Particulate Matter,” Rule  
3, “Wood-Burning Devices”
- 2. Lead Agency Name and Address:** Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, California 94109
- 3. Contact Person and Phone Number:** Eric Pop, Compliance and Enforcement Division  
415/749-5172 or [epop@baaqmd.gov](mailto:epop@baaqmd.gov)
- 4. Project Location:** This rule applies to the area within the jurisdiction of the  
BAAQMD, which encompasses all of Alameda, Contra  
Costa, Marin, San Francisco, San Mateo, Santa Clara,  
and Napa Counties and portions of southwestern Solano  
and southern Sonoma Counties. The constituents  
affected by the rule are located in the entire area under  
Bay Area Air Quality Management District jurisdiction.
- 5. Project Sponsor’s Name and Address:** (same as above)
- 6. General Plan Designation:** N/A
- 7. Zoning:** N/A
- 8. Description of Project:** See “Background” in Chapter 1
- 9. Surrounding Land Uses and Setting:** See “Affected Area” in Chapter 1
- 10. Other Public Agencies Whose  
Approval Is Required:** None

# Appendix A - Notice of Preparation and Initial Study

## Environmental Factors Potentially Affected:

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a “Potentially Significant Impact”, “Less Than Significant With Mitigation Incorporated”, or “Less-than-Significant Impact”), as indicated by the checklist on the following pages.

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Aesthetics                      | <input type="checkbox"/> Agricultural Resources             | <input checked="" type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources            | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology/Soils          |
| <input type="checkbox"/> Hazards and Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality            | <input type="checkbox"/> Land Use/Planning      |
| <input type="checkbox"/> Mineral Resources               | <input type="checkbox"/> Noise                              | <input type="checkbox"/> Population/Housing     |
| <input type="checkbox"/> Public Services                 | <input type="checkbox"/> Recreation                         | <input type="checkbox"/> Transportation/Traffic |
| <input type="checkbox"/> Utilities/Service Systems       | <input type="checkbox"/> Mandatory Findings of Significance |   |

## Determination:

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, so that an ENVIRONMENTAL IMPACT REPORT will be prepared.
- I find that the proposed project MAY have an impact on the environment that is “potentially significant” or “potentially significant unless mitigated” but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis, as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
For

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	
<b>I. AESTHETICS.</b>					
Would the project:					
a.	Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. In terms of physiography, the Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses.

## Discussion of Impacts

a–d. Regulation 6, Rule 3 (Rule 6-3) is designed to limit emissions of particulate matter and visible emissions from wood-burning devices, through the requirement to use compliant wood-burning devices and prevent the use of non-compliant wood-burning devices during curtailment periods.

Rule 6-3 would restrict installation of wood-burning devices in new construction of buildings or structures to United States Environmental Protection Agency (U.S. EPA) Phase II certified wood-burning devices, pellet-fueled devices, or low mass fireplaces of a make and model that meets U.S. EPA low mass fireplace emission targets and has been approved in writing by the Air Pollution Control Officer (APCO) from the BAAQMD. In new developments, the installation of compliant wood-burning devices is expected to look essentially the same as non-



## Appendix A - Notice of Preparation and Initial Study

compliance devices, so no change in the visual character of the environment is expected.

Rule 6-3 would establish criteria for the sale and installation of wood-burning devices. These requirements would control the type of indoor wood-burning devices that can be installed or used to replace existing devices. The Rule 6-3 compliant devices are similar in size and structure to the non-compliant devices, therefore this requirement is not expected to have an effect on the visual character of the environment. Proposed Rule 6-3 would reduce emissions of particulate matter, which can impact visibility, as well as air quality. A reduction in particulate matter emissions is expected to generate better visibility in the Bay Area.

Rule 6-3 would not require any new development, and compliant devices appear similar to non-compliant devices, therefore, obstruction of scenic resources or degrading the visual character of a site, including but not limited to: trees, rock outcroppings, or historic buildings, is not expected.

Rule 6-3 does not require any light generating equipment for compliance, so no additional light or glare would be created to affect day or nighttime views in the District.

Based on these considerations, significant adverse aesthetic impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant aesthetic impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>II. AGRICULTURAL RESOURCES.</b>				
In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

As described under “Aesthetics,” land uses within the jurisdiction of the BAAQMD vary greatly and include agricultural lands. Some of these agricultural lands are under Williamson Act contracts.

## Discussion of Impacts

a–c. Rule 6-3 is designed to limit emissions of particulate matter and visible emissions from wood-burning devices. The proposed rule would not require conversion of existing agricultural land to other uses. The proposed rule is not expected to conflict with existing agriculture-related zoning designations or Williamson Act contracts. Williamson Act lands within the boundaries of the BAAQMD would not be affected. No effects on agricultural resources are expected because the proposed rule would not required any new development, but would require compliant wood-burning devices in new development areas. Therefore, there is no

## Appendix A - Notice of Preparation and Initial Study

potential for conversion of farmland to non-agricultural use or conflicts related to agricultural uses or land under a Williamson Act contract.

Based on these considerations, significant adverse impacts to agricultural resources are not anticipated and will not be further analyzed in a Draft EIR. Since no significant agricultural were identified, no mitigation measures are necessary or required.

## Appendix A - Notice of Preparation and Initial Study

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
III.	<b>AIR QUALITY.</b>				
	When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a.	Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e.	Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollution?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

The pollutants of greatest concern in the BAAQMD are various components of photochemical smog (ozone and other pollutants), particulate matter less than or equal to 10 microns in diameter (PM<sub>10</sub>), and particulate matter less than or equal to 2.5 microns in diameter (PM<sub>2.5</sub>). Ozone, a criteria pollutant, is formed from a

reaction of volatile organic compounds and oxides of nitrogen in the presence of ultraviolet light (sunlight). Particulate matter is made up of particles that are emitted directly, such as products of combustion and fugitive dust, as well as secondary particles that are formed in the atmosphere from reactions involving precursor pollutants such as oxides of nitrogen, sulfur oxides, volatile organic compounds, and ammonia. Secondary PM and combustion particles tend to be fine particles (PM<sub>2.5</sub>), whereas fugitive dust is mostly coarse particles.

The Bay Area is classified as a non-attainment area for both the California and national ozone standards. The California standards are more stringent than the national standard. The Bay Area attains the national annual PM<sub>10</sub> standard, but is not in attainment of the California annual PM<sub>10</sub> or PM<sub>2.5</sub> or the California 24-hour PM<sub>10</sub> standard. The Bay Area is unclassified for the national 24-hour PM<sub>10</sub> and 24-hour PM<sub>2.5</sub> standard. There is no national annual PM<sub>10</sub> standard or California 24-hour PM<sub>2.5</sub> standard. As with ozone, the California standards are more stringent. Particulate matter can cause serious health effects such as aggravated asthma, nose and throat irritation, bronchitis, lung damage, and premature death.

## Discussion of Impacts

- a., c. Rule 6-3 is being proposed as part of an air quality control plan. In 2005 the BAAQMD published the “Particulate Matter Implementation Schedule”, pursuant to Senate Bill 656 (SB656), and wood smoke reduction was identified in that Schedule as a priority. Subsequently, the Air District Advisory Council examined wood smoke impacts on PM<sub>2.5</sub> levels and issued recommendations to the Air District Board of Directors. The recommendations were accepted by the Air District Board of Directors and staff began work on a wood smoke reduction strategy. Rule 6-3 is one of many measures that, collectively, will reduce emissions of particulate matter and progress towards meeting the applicable federal and state air quality standards. The measures are not contingent on each other. Consequently, the rule is part of, and will not interfere with the implementation of an air quality plan.

The criteria pollutants are defined by the US EPA. They are ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxide. Rule 6-3 would limit emissions of particulate matter by requiring that new and replacement wood-burning devices meet EPA emissions criteria, restricting the installation of wood-burning devices that do not meet EPA emissions criteria in new construction, and by limiting the use of the existing devices under one of two options on certain nights as described in Chapter 1. None of these measures could result in the increase of any of the criteria pollutants.

- b., d. The primary purpose of Regulation 6, Rule 3 is to limit emissions of particulate matter and visible emissions from wood-burning devices as

part of an overall wood smoke reduction program within the jurisdiction of the BAAQMD. Wood smoke has been a concern in the District since scientific research began establishing a stronger connection between public health and emissions from wood smoke. Combustion processes, including the combustion of wood in wood-burning devices, are a major source of manmade air pollution, including particulate matter. Carbon monoxide, hydrocarbons, nitrogen oxides and toxic compounds are additional dangerous byproducts from the combustion of wood.

- e. Rule 6-3 will result in a decrease in particulate emissions from wood burning devices. Wood burning devices can generate smoke that has a distinctive odor. Affected devices are not expected to create objectionable odors affecting a substantial number of people because the installation of compliant wood burning devices are expected to result in more efficient combustion, reducing particulate matter emissions and the related odors. Further, Rule 6-3 would prohibit the burning of garbage, treated wood, non-seasoned wood, used or contaminated wood pallets, plastic products, rubber products, waste petroleum products, paints and paint solvents, coal, animal carcasses, colored paper, salt water driftwood, particle board, and any material not intended by a manufacturer for use as a fuel in a wood-burning device. This requirement should also reduce odors.
- f. Even though the proposed rule is expected to result in a decrease in particulate matter emissions providing an air quality benefit, the proposed project may result in an increase in greenhouse gas emissions generating a potential impact on global climate change. This is because wood, a renewable resource, is considered “carbon neutral” whereas natural gas combusted to produce heat is not renewable and produces carbon dioxide, the primary contributor to global climate change. Therefore, there is the potential for cumulative greenhouse gas impacts which will be evaluated in a Draft EIR. Therefore, an EIR will be prepared to address air quality impacts associated with greenhouse gas emissions.

Based on these considerations, the cumulative increase in greenhouse emissions are potentially significant and will be further analyzed in a Draft EIR.

## Appendix A - Notice of Preparation and Initial Study

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
<b>IV. BIOLOGICAL RESOURCES.</b>					
	Would the project:				
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include

commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

## Discussion of Impacts

- a-f Rule 6-3 is designed to limit emissions of particulate matter and visible emissions from wood-burning devices. The proposed rule would not require or bring about new residential or commercial development, but would restrict the installation of wood-burning devices in new development. Installation of new compliant devices is expected to be similar to installation of non-compliant devices. Therefore, installing compliant devices in new development or in existing structures is not expected to create additional impacts. Any new development that must comply with Rule 6-3 are constructed for business reasons other than to comply with Rule 6-3. Such projects may or may not have adverse impacts on biological resources. However, these projects would be built regardless of whether or not Rule 6-3 is in effect. As a result, the proposed rule would not directly or indirectly affect riparian habitat, federally protected wetlands, or migratory corridors.

The proposed rule would not conflict with local policies or ordinances protecting biological resources nor local, regional, or state conservation plans because it will only affect or restrict wood-burning devices in new development or prevent non-compliant wood-burning devices during curtailment periods. The proposed rule will also not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other relevant habitat conservation plan.

Therefore, the proposed rule neither requires nor is likely to result in activities that would affect sensitive biological resources. Therefore, no significant adverse impacts on biological resources are expected.

Based on these considerations, significant adverse impacts to biological resources are not anticipated and will not be further analyzed in a Draft EIR. Since no significant impacts to biological impacts were identified, no mitigation measures are necessary or required.



	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>V. CULTURAL RESOURCES.</b>				
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

Cultural resources are defined as buildings, sites, structures, or objects that might have historical, architectural, archaeological, cultural, or scientific importance. The State CEQA Guidelines define a significant cultural resource as a “resource listed or eligible for listing on the California Register of Historical Resources (CRHR)” (Public Resources Code Section 5024.1). A project would have a significant impact if it would cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5[b]). A substantial adverse change in the significance of a historical resource would result from an action that would demolish or adversely alter the physical characteristics of the historical resource that convey its historical significance and that qualify the resource for inclusion in the CRHR or in a local register or survey that meets the requirements of Public Resources Code Sections 5020.1(k) and 5024.1(g).

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD’s jurisdiction.

## Discussion of Impacts

- a.-d. The proposed rule is not expected to have an effect on cultural resources because the proposed rule would not cause any new development. Rule 6-3 does not require any changes to existing fireplaces or other wood-burning devices. Therefore, Rule 6-3 is not expected to have significant impacts to historic buildings or require that wood-burning devices in historic buildings be removed or replaced.

The proposed rule would require that any new wood-burning devices installed be compliant with Rule 6-3. The removal and installation of non-compliant and compliant devices is not expected to require the use of heavy construction equipment, therefore, no impacts to historical resources are expected as a result of implementing Rule 6-3. No physical changes to the environment are expected to be required preventing disturbance to any paleontological or archaeological resources, nor would the rule require any physical changes that could disturb human remains. Any new residential or commercial operation that could have significant adverse affects on cultural resources would go through the same approval and construction process regardless of whether or not the proposed Rule 6-3 were in affect.

Based on these considerations, significant adverse impacts to cultural resources are not anticipated and will not be further analyzed in a Draft EIR. Since no significant impacts to cultural resources were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>VI. GEOLOGY AND SOILS.</b>				
Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Strong seismic groundshaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast

(approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Regional basement rocks consist of the highly deformed Great Valley Sequence, which include massive beds of sandstone interfingering with siltstone and shale. Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Strait and Suisun Bay. The estuarine sediments found along the shorelines of Solano County are soft, water-saturated mud, peat and loose sands. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a plate boundary marked by the San Andreas Fault System. Several northwest trending active and potentially active faults are included with this fault system. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along "active" faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). In the Bay area, these faults include the San Andreas, Hayward, Rodgers Creek-Healdsburg, Concord-Green Valley, Greenville-Marsh Creek, Seal Cove/San Gregorio and West Napa faults. Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

## Discussion of Impacts

- a.-e. No impacts on geology and soils are anticipated from the proposed rule that would apply to existing residential and commercial operations. The wood-burning devices to be regulated as part of this new rule will not create new development in the area. The proposed rule does not directly require structural alterations to existing structures.

Any new structures in the area must be designed to comply with the Uniform Building Code Zone 4 requirements since the Bay Area is located in a seismically active area. The local cities or counties are responsible for assuring that the proposed project complies with the

Uniform Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage.

The Uniform Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The Uniform Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site.

Any new residential or commercial operations will be required to obtain building permits, as applicable, for all new structures. New development or commercial operations must receive approval of all building plans and building permits to assure compliance with the latest Building Code prior to commencing construction activities. The issuance of building permits from the local agency will assure compliance with the Uniform Building Code requirements which include requirements for building within seismic hazard zones. No significant impacts from seismic hazards are expected since the project will be required to comply with the Uniform Building Codes. No major construction activities are expected from the proposed rule. Therefore, no significant adverse impacts on geology and soils are expected.

Since Rule 6-3 would mostly affect new residential and commercial operations in the area, it is expected that the soil types present in the affected facilities and residences would not be further susceptible to expansive soils or liquefaction due to adoption of the proposed rule. Additionally, subsidence is not expected to occur because grading, or filling activities at affected facilities and residences despite adoption of the proposed rule that would only restrict the installation of wood-burning devices.

The proposed project has no affect on the installation of septic tanks or alternative wastewater disposal systems. Consequently, no impacts from failures of septic systems related to soils incapable of supporting such systems are anticipated.

Based on these considerations, significant adverse geology and soil impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant geology and soils impacts were identified, no mitigation measures are necessary or required.

## Appendix A - Notice of Preparation and Initial Study

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than- Significant Impact	No Impact
<b>VII. HAZARDS AND HAZARDOUS MATERIALS.</b>					
	Would the project:				
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h.	Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Facilities and operations within the District handle and process substantial quantities of flammable materials and acutely toxic substances. Accidents involving these substances can result in worker or public exposure to fire, heat, blast from an explosion, or airborne exposure to hazardous substances.

Fires can expose the public or workers to heat. The heat decreases rapidly with distance from the flame and therefore poses a greater risk to workers at specific facilities where flammable materials and toxic substances are handled than to the public. Explosions can generate a shock wave, but the risks from explosion also decrease with distance. Airborne releases of hazardous materials may affect workers or the public, and the risks depend upon the location of the release, the hazards associated with the material, the winds at the time of the release, and the proximity of receptors.

For all facilities and operations handling flammable materials and toxic substances, risks to the public are reduced if there is a buffer zone between process units and residences or if prevailing winds blow away from residences. Thus, the risks posed by operations at a given facility or operation are unique and determined by a variety of factors.

## Discussion of Impacts

- a., b. Since wood, pellet-fuel, and wood ash are not considered hazardous materials, use of compliant wood-burning devices would not require the routine transport, use, or disposal of hazardous materials. The restriction of compliant wood-burning devices in new development and commercial operations, or prohibition of non-compliant wood-burning devices during curtailment periods, would not create a significant hazard to the public or environment through a reasonable foreseeable upset and accident conditions involving hazardous materials. The use of electrical heaters as an alternative to wood-burning devices would not result in potentially significant adverse impacts because the use of hazardous materials would not be required.

While natural gas devices substituted for wood-burning devices could introduce greater explosive risk, the majority of residences and facilities in the District already have natural gas service. Natural gas is flammable, can be explosive under certain conditions, and a release of

natural gas may result in potentially significant hazards and risk of upset to people. The majority of facilities that would be affected by the proposed rule already have natural gas pipeline infrastructure for natural gas delivery. Natural gas burning devices must meet American National Standards Institute (ANSI) standards. Compliance with applicable federal, state and local regulatory requirements for the design and installation of natural gas devices would make the risk of accidental release less than significant. Further, Rule 6-3 includes an exemption from Rule 6-3 for wood-burning devices in areas where natural gas service is not available; therefore, Rule 6-3 will not require the installation of new natural gas utility lines or increase the hazards related to the use of natural gas.

- c. The proposed rule would not generate hazardous emissions, handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. The use of compliant wood-burning devices in new development and during curtailment periods would not generate as many hazardous emissions as non-compliant wood-burning devices. Replacement of wood-burning devices with electric devices would reduce hazardous emissions or hazardous materials associated with wood burning.

Replacement of wood-burning devices with natural gas devices could increase risk of explosion. However, since natural gas devices would require building permits, compliance with federal, state, and local regulatory requirements for the design and installation of natural gas devices would limit the risk of accidental release to the degree that the risk would be expected to be less than significant regarding schools.

- d. The proposed rule would restrict the type of wood-burning devices at new residences and commercial operations. Government Code §65962.5 is related to hazardous material sites at industrial facilities. The proposed rule would affect residences and commercial facilities such as hotels, restaurants, lodges, etc., which are typically not associated with hazardous waste sites. Therefore, commercial facilities and residences would not normally be included on the list of hazardous material sites compiled pursuant to Government Code §65962.5. As a result, Rule 6-3 is not expected to affect any facilities included on a list of hazardous material sites and, therefore, would not create a significant hazard to the public or environment.
- e – f. The proposed rule would not result in a safety hazard for residents or workers within two miles of a public airport, a public use airport, or a private air strip. The use of compliant wood-burning, or alternative, devices in new development would not generate as many hazardous emissions as non-compliant wood-burning devices. Replacement of wood-burning devices with electric devices would reduce hazardous emissions or hazardous materials from wood burning.



Replacement of wood-burning devices with natural gas devices could increase risk of explosion. However, since natural gas devices would require building permits, compliance with federal, state, and local regulatory requirements for the design and installation of natural gas devices would limit the risk of accidental release to the degree that the risk would be expected to be less than significant regarding public airports or private air strip.

- g. No impacts on emergency response plans are anticipated from the proposed rule. Wood-burning devices or their alternatives are not typically major components of any evacuation or emergency response plan. The proposed rule neither requires nor is likely to result in activities that would impact the emergency response plan. No major construction activities are expected from the proposed rule. Therefore, no significant adverse impacts on emergency response plans is expected.
- h. No increase in hazards related to wildfires is anticipated from the proposed rule that would apply to existing structures utilizing compliant wood-burning devices. The proposed rule will not create new residential or commercial land use projects. Any new development that might occur in the District would occur for reasons other than the proposed rule. New land use project would require a CEQA analysis that would evaluate wildfire risks. Mitigation measures would be required to reduce impacts to the maximum extent possible if the analysis determined such risks to be significant. Proposed Rule 6-3 is not expected to reduce the amount of brush cleared in wildfire hazard areas as the brush clearing is generally required for compliance with fire codes. The burning of brush in wood burning devices under proposed Rule 6-3 could still be accomplished, as long as the brush is seasoned and not burned on prohibited days. Most wood brush from private property that would be burned is seasoned before burning to produce a desirable (hot) fire. As Rule 6-3 would only provide minor and sporadic delays in burning, no significant impacts are expected.

Based on these considerations, significant adverse hazards and hazardous materials are not anticipated and will not be further analyzed in a Draft EIR. Since no significant hazard and hazardous materials impacts were identified, no mitigation measures are necessary or required.

## Appendix A - Notice of Preparation and Initial Study

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>VIII. HYDROLOGY AND WATER QUALITY.</b>				
Would the project:				
a. Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Place within a 100-year flood hazard area structures that would impede or redirect floodflows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
j.	Contribute to inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and affected environment vary substantially throughout the area and include commercial, industrial, residential, agricultural, and open space uses. Rule 6-3 would apply to all areas within the BAAQMD’s jurisdiction.

Reservoirs and drainage streams are located throughout the area and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the area under BAAQMD jurisdiction.

## Discussion of Impacts

- a – j. Rule 6-3 would limit the installation of new, and replacement of existing wood-burning devices in the District to compliant wood-burning devices. Compliant wood-burning devices do not use water for any reason, nor do they generate wastewater. Any construction activities regarding replacement of non-compliant wood-burning devices would be minor and would not require heavy equipment, so there would be no soil disturbance attributed to the proposed rule.

No impacts on hydrology/water quality resources are anticipated from the proposed rule. Because compliant wood-burning devices do not use water for any reason, the proposed rule would not require construction of additional water resource facilities, create the need for new or expanded water entitlements, of necessitate alteration of drainage patterns. The residences and commercial operations affected by the proposed rule are required to comply with wastewater discharge regulations. The requirement to utilize compliant wood-burning devices will have no impact on wastewater discharges, alter drainage patterns, create additional water runoff, place any additional structures

## Appendix A - Notice of Preparation and Initial Study

within 100-year flood zones or other areas subject to flooding, or contribute to inundation by seiche, tsunami or mudflow. No major construction activities are expected from the proposed rule and no new structures are required. Therefore, no significant adverse impacts on hydrology/water quality are expected.

Based on these considerations, significant adverse hydrology and water quality impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant hydrology and water quality impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>IX. LAND USE AND PLANNING.</b>				
Would the project:				
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

## Discussion of Impacts

a-c. Rule 6-3 would not create any new development, but would restrict installation of wood-burning devices to compliant devices in new development and prohibit burning of non-compliant devices during curtailment periods. Thus, Rule 6-3 does not include any components that would mandate physically dividing an established community or generate additional development.

The proposed rule has no components which would affect land use plans, policies, or regulations. Regulating PM10 and PM2.5 emissions from wood-burning devices will not require local governments to alter land use and other planning considerations due to the proposed rule. Habitat conservation or natural community conservation plans, agricultural resources or operations, would not be affected by Rule 6-3, and divisions of existing communities would not occur. Therefore, current or planned

## Appendix A - Notice of Preparation and Initial Study

land uses with the District will not be significantly affected as a result of Rule 6-3.

Based on these considerations, significant adverse land use impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant land use impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>X. MINERAL RESOURCES.</b>				
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

## Discussion of Impacts

- a-b. The proposed rule is not associated with any action that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. The proposed rule is not expected to create new development or result in construction outside any existing facility. Therefore, no significant impact to mineral resources is anticipated as a result of Rule 6-3.

Based on these considerations, significant adverse impacts to mineral resources are not anticipated and will not be further analyzed in a Draft EIR. Since no significant mineral resources impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>XI. NOISE.</b>				
Would the project:				
a.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?				
b.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Expose persons to or generate excessive groundborne vibration or groundborne noise levels?				
c.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				
d.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				
e.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?				
f.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?				

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

## Discussion of Impacts

- a. Rule 6-3 would restrict installation of wood-burning devices in new development and prohibit use of non-compliant wood



burning devices during curtailment periods. Since no heavy-duty equipment is required to install compliant devices, noise impacts associated with the proposed rule are expected to be minimal. Operation of compliant wood-burning devices may require the addition of blowers or exhaust fans. Blowers and exhaust fans would be regulated by local building permits and are similar in some respects to those used in household water heaters. Noise from these systems, both indoors and outdoors, is expected to be limited to acceptable levels by the building permit process. Therefore, residences and commercial operations affected by the proposed rule are not expected to have a significant adverse affect on local noise control laws or ordinances.

- b. Rule 6-3 is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. Equipment used to install wood-burning devices in new or existing residences or commercial operations are not in any way expected to generate vibrations.
- c. Rule 6-3 is not expected to result in a substantial permanent increase in ambient noise levels in the District. The proposed rule would not create new development. Compliant equipment and non-compliant equipment operate at similar noise levels, and are designed to be operated in residences and commercial facilities (e.g., hotels, restaurants, etc.), where operators are protected by noise regulations, and residences will not tolerate excessive noise levels. Permanent increases in noise levels are not anticipated as a result of the proposed rule.
- d. Rule 6-3 is not expected to increase periodic or temporary ambient noise levels to levels existing prior to the proposed rule. The installation or replacement of wood-burning devices in new facilities would require minor construction activities and would not require the use of heavy equipment. Operational noise levels are expected to be equivalent to existing noise levels as discussed earlier.
- e., f. Implementation of Rule 6-3 would require only minor construction in existing facilities, and does not require the use of heavy equipment for installation in new or existing residences or commercial operations. No new noise impacts are expected from any existing facilities during construction or operation regardless of their proximity to a public/private airport. Thus, people residing or working in the vicinities of public/private airports are not expected to be exposed to excessive noise levels due to the proposed project.

## Appendix A - Notice of Preparation and Initial Study

Based on these considerations, significant adverse noise impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant noise impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>XII. POPULATION AND HOUSING.</b>				
Would the project:				
a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD’s jurisdiction.

## Discussion of Impacts

- a–c. The proposed rule is not expected to result in the construction of new facilities or the displacement of housing or people. Implementation of the proposed rule will result require that new development install compliant wood-burning devices and restricts wood-burning devices during curtailment periods development. These modifications and restrictions would not induce growth or displace housing or people in any way. The proposed rule is not expected to result in significant adverse affects on population or housing.

Based on these considerations, significant adverse impacts on population and housing are not anticipated and will not be further analyzed in a Draft EIR. Since no significant population and housing impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
--	--------------------------------	--	------------------------------	-----------

**XIII. PUBLIC SERVICES.**

Would the project:

- a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD’s jurisdiction.

Given the large area covered by the BAAQMD, public services are provided by a wide range of entities. Fire protection and police protection/law enforcement services within the BAAQMD is provided by various districts, organizations, and agencies. There are several school districts, private schools, and park departments within the BAAQMD. Public facilities within the BAAQMD are managed by different county, city, and special-use districts.

## Discussion of Impacts

- a., b. The facilities affected by the proposed rule are not expected to require any new or additional public services. As shown in Section VII – Hazards and Hazardous Material of this Initial Study, the use of compliant wood burning appliances is not expected to generate significant explosion or fire hazard impacts so no increase in fire protection services is expected. Rule 6-3 is not expected to have any adverse effects on local police departments and require additional police services as it would only require the installation of compliant wood-burning devices for new development. Rule 6-3 would not require the development and these projects would be built regardless of whether or not Rule 6-3 is in effect. Therefore, no significant adverse fire and police protection impacts from the proposed rule are expected.
- c., d. As discussed in Section XII, Population and Housing, implementing Rule 6-3 would not induce population growth. Therefore, with no increase in local population anticipated, additional demand for new or expanded schools or parks is not anticipated. As a result, no significant adverse impacts are expected to local schools or parks.
- e. Besides building permits, there is no other need for government services. The proposal would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There will be no increase in population as a result of implementing Rule 6-3, therefore, no need for physically altered government facilities.

Based on these considerations, significant adverse impacts on public services are not anticipated and will not be further analyzed in a Draft EIR. Since no significant public services impacts were identified, no mitigation measures are necessary or required.

---

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
--	--------------------------------	--	------------------------------	-----------

---

**XIV. RECREATION.**

Would the project:

- |    |   |                          |                          |                          |                                     |
|----|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. | Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD’s jurisdiction.

## Discussion of Impacts

- a–b. Rule 6-3 has no provisions affecting land use plans, policies, or regulations. The proposed project would not increase or redistribute population and, therefore, would not increase the demand for or use of existing neighborhood and regional parks or other recreational facilities or require the construction of new or the expansion of existing recreational facilities. Therefore, implementation of Rule 6-3 is not expected to have any significant adverse impacts on recreation.

Based on these considerations, significant adverse impacts on recreation are not anticipated and will not be further analyzed in a Draft EIR. Since no significant recreation impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>XV. TRANSPORTATION/TRAFFIC.</b>				
Would the project:				
a. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Cause, either individually or cumulatively, exceedance of a level-of-service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

Transportation infrastructure within the BAAQMD ranges from single-lane roadways to multilane interstate highways. Transportation systems between major hubs are located within and outside the BAAQMD, including railroads,

airports, waterways, and highways. Localized modes of travel include personal vehicles, busses, bicycles, and walking.

### Discussion of Impacts

- a., b. Additional traffic or significant increases of staffing at existing residential or commercial facilities that would result in changes to traffic patterns or levels is not expected. The proposed rule would not involve any activities that would alter air traffic patterns; substantially increase hazards caused by design features; result in inadequate parking capacity; or conflict with adopted policies, plans, or programs supporting alternative transportation. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.
- c. The proposed rule could result in minor modifications to existing residences and commercial operations as well as restrictions on the type of wood-burning devices to be installed in new development. The proposed rule is not expected to involve the delivery of materials via air so no increase in air traffic is expected.
- d., e. The proposed rule is not expected to increase traffic hazards or create incompatible uses. No affect on emergency access to affected residences or commercial facilities is expected from adopting the proposed rule. Utilizing compliant wood-burning devices versus non-compliant devices is not expected to have a significant adverse impact on traffic hazards, create incompatible uses or emergency access.
- f. No changes are expected to parking capacity at or in the vicinity of affected facilities as Rule 6-3 only pertains to wood-burning devices. No increase in permanent workers is expected. Therefore, the proposed rule is not expected to result in significant adverse impacts on parking.
- g. The proposed rule affects wood-burning devices and is not expected to conflict with adopted policies, plans, or programs supporting alternative transportation modes (e.g., bus turnouts, bicycle racks).

Based on these considerations, significant adverse transportation and traffic impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant transportation and traffic impacts were identified, no mitigation measures are necessary or required.



	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
--	--------------------------------	--	------------------------------	-----------

**XVI. UTILITIES AND SERVICE SYSTEMS.**

Would the project:

a.	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b.	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c.	Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e.	Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g.	Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and portions of western Solano and southern Sonoma Counties. Because the area of coverage is so vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses. Rule 6-3 would apply to all areas within the BAAQMD's jurisdiction.

## Discussion of Impacts

- a-e. The proposed rule is restricted to both the installation of new, and replacement of existing wood-burning devices, with compliant devices. These regulations regarding wood-burning devices will not generate or affect wastewater, stormwater or stormwater drainage, and will not require water or affect water supplies. No increases in demand for public utilities are expected as a result of the proposed rule.
  
- f., g. Rule 6-3 would require the installation of compliant wood-burning devices and generally would not generate additional waste. Rule 6-3 could encourage the replacement of existing devices with newer compliant devices. As existing devices are replaced, their disposal is expected to be categorized as solid waste. Solid waste is either recycled or disposed of in landfills. Rule 6-3 is not expected to generate any significant increase in solid waste. Since any facilities would be replacing their non-compliant wood burning devices because of a remodel, not because of Rule 6-3, compliant wood burning devices installed during remodels and non-wood burning devices installed in new development are not expected to generate any more solid waste than non Rule 6-3 compliant devices. In fact, natural gas burning devices would not generate solid waste (e.g., wood ash). Therefore, no significant adverse impacts are expected to solid waste as a result of the proposed rule.

Based on these considerations, significant adverse utilities and service system impacts are not anticipated and will not be further analyzed in a Draft EIR. Since no significant utilities and service system impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
<b>XVII. MANDATORY FINDINGS OF SIGNIFICANCE</b>				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Does the project have impacts that are individually limited but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Discussion of Impacts

- a. Rule 6-3 is not expected to create any new development. Because the rule will not require development, the proposed rule does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Therefore, no significant adverse impacts are expected as a result of the proposed rule.
  
- b. Even though the proposed rule is expected to result in a decrease in particulate matter emissions providing an air quality benefit, the proposed project may result in an increase in greenhouse gas emissions generating a potential impact on global climate

## Appendix A - Notice of Preparation and Initial Study

change. Therefore, there is the potential for cumulative greenhouse gas impacts which will be evaluated in a Draft EIR. Rule 6-3 is not expected to generate any project-specific significant environmental impacts and is not expected to cause cumulative impacts in conjunction with any other environmental resources. Therefore, an EIR will be prepared to address air quality impacts associated with greenhouse gas emissions.

- c. Other than greenhouse gas impacts, Rule 6-3 is not expected to cause significant adverse effects on human beings. In fact Rule 6-3 is expected to reduce particulate matter emissions, reduce exposure to particulate matter, and reduce health impacts associated with exposure to particulate matter. Adoption of the rule is not expected to create significant adverse impacts on air quality. From the proceeding analyses, significant adverse impacts on aesthetics, agricultural resources, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, utility and service systems, and transportation and traffic are not an expected result from adoption of Rule 6-3.

## **APPENDIX B**

---

### **RESPONSE TO COMMENTS RECEIVED ON THE DRAFT ENVIRONMENTAL IMPACT REPORT**

## **APPENDIX B**

### **FINAL ENVIRONMENTAL IMPACT REPORT**

#### **BAY AREA AIR QUALITY MANAGEMENT DISTRICT REGULATION 6, RULE 3, WOOD-BURNING DEVICES**

##### **COMMENTS AND RESPONSES TO COMMENTS**

### **INTRODUCTION**

This Appendix, together with other portions of the Draft Environmental Impact Report (Draft EIR), constitute the Final EIR for the proposed BAAQMD Regulation 6, Rule 3, Wood-Burning Devices Project.

The Draft EIR was circulated for a 45-day public review and comment period on May 5, 2008 and ending June 18, 2008. The Draft EIR is available at the Bay Area Air Quality Management District (BAAQMD), 939 Ellis Street, San Francisco, California 94109, or by phone at (415) 749-5172. The Draft EIR can also be downloaded by contacting the BAAQMD's web pages at:

[http://www.baaqmd.gov/pln/ruledev/regulatory\\_public\\_hearings.htm](http://www.baaqmd.gov/pln/ruledev/regulatory_public_hearings.htm).

The Draft EIR contained a detailed project description, the environmental setting for each environmental resource where the NOP/IS determined there was a potential significant adverse impact, an analysis of the potentially significant environmental impacts including cumulative impacts, project alternatives, mitigation measures, and other areas of discussion as required by CEQA. The discussion of the project-related and cumulative environmental impacts included a detailed analysis of air quality and greenhouse gas emissions.

The BAAQMD received three comment letters on the Draft EIR during the public comment period. The comment letters and responses to the comments raised in those letters are provided in this appendix. The comments are bracketed and numbered. The related responses are identified with the corresponding number and are included following each comment letter.

**From:** Robert Poindexter [mailto:bob@epoindexter.com]  
**Sent:** Thursday, May 22, 2008 11:46 AM  
**To:** Eric Pop  
**Subject:** Comments to the Draft EIR on proposed Regulation 6, Rule 3: Wood Burning Devices

Pursuant to The California Environmental Quality Act I am submitting these comments to BAAQMD in connection with the Draft Environmental Impact Report prepared for BAAQMD for purposes of its proposed Regulation 6, Rule 3. I ask that the District consider these comments and make them part of the Environmental Impact Report. Also, please advise me if there are any changes to the EIR or if the District takes any action with respect to the EIR. Finally, I would appreciate it if you would send me a response to this email to confirm that you have received my comments.

I believe the Draft Environmental Impact Report (EIR) prepared for BAAQMD for purposes of its proposed Regulation 6, Rule 3 contains some substantial errors in connection with its conclusion that greenhouse gas (GHG) emissions will not increase as a result of Rule 6-3.

The EIR relied heavily on a 2003 study by the Australian Greenhouse Office (<http://www.greenhouse.gov.au/nrm/publications/pubs/firewood.pdf>) that was designed to compare GHG emissions from wood burned for domestic heating to GHG emissions from domestic heating from nonrenewable sources such as natural gas. The Australian study looked at wood collected from three different sources, remnant woodlands, managed native forests and new wood plantations. The study considered the loss of carbon sequestered in the woodlands and forests as a result of the harvesting of firewood as well as the cost of transportation and processing. In each case the study found that the use of firewood for domestic heating resulted in less GHG emissions than nonrenewable heating sources. Overall the Australian study concluded “in terms of limiting net greenhouse gas emissions, firewood is generally more favorable for domestic heating than other non-renewable sources of energy.”

1-1

The EIR calculates that the proposed Rule 6-3 would cause fireplace users to resort to their gas furnaces and, with full compliance, result in as much as an additional 31,900 metric tons of CO<sub>2</sub>, a greenhouse gas, being introduced into the atmosphere annually. Despite this finding the District concludes that its proposed fireplace restrictions would not result in any increase in greenhouse gas emissions. How did the EIR reach a conclusion so different from the Australian study upon which it relied so heavily? The EIR investigators made the assumption that all of the wood being used in fireplaces was being sourced by the elimination of woodlands and that the loss of those trees (and the CO<sub>2</sub> being sequestered in them) offset the benefit derived from heating with wood. The District does not cite any basis for its assumption that woodlands are being eliminated in order to provide fuel for fireplaces. The only investigation on this issue disclosed in the EIR is that researchers reviewed firewood dealer advertising. The EIR itself contradicts the District’s assumption stating that much of the loss of woodlands in the Bay Area is

1-2

1-3

APPENDIX B- RESPONSE TO COMMENTS

---

due to urban growth, conversion of land to vineyards and Sudden Oak Death, all activities that would occur regardless of fireplace use.

1-3  
concluded

I conducted a survey of all firewood dealers listed in the June 2007 AT&T yellow pages for Marin County. A summary of the information provided from all such dealers who were willing to provide information follows:

Bear Bottom Farms, 508 De Carlo Ave., Richmond, CA, (415) 454-2917  
Contact: Don Podesto, manager

They sell approximately 2,500 cords/year. Approximately 60% is almond, 30% walnut and 5% cherry and 5% other. The almond, walnut and cherry wood principally comes from farmers in the central valley who tear out old trees and replace them with younger trees in order to improve production. Approximately 90% is replanted. The farmer will typically pay to have the trees removed and cut into pieces and the wood is sold to firewood dealers. The farmer's removal costs are typically about equal to what is paid by firewood dealers. Sometimes the wood is just turned into chips in which case the farmer incurs a substantial net expense.

1-4

This dealer regularly gets calls from tree services offering oak and other wood for free but the offers are rejected because those woods are incompatible with the operation.

Marin Resource Recovery Center, 565 Jacoby St., San Rafael, CA, (415) 860-2601  
Contact: Joe Garbarino, manager

They sell 300 to 350 cords/year. Approximately 60% pine, 15% eucalyptus, 15% bay, 10% oak. All wood is brought to them as refuse for disposal. He cuts and dries the wood before selling.

(Note: This firewood seller is not listed in the AT&T yellow pages. I included them because it is where I have sourced my firewood for the past few years.)

Valley Firewood, (415) 302-9797



Contact: Angel Loza, manager

They sell approximately 250 cords/year. Approximately 70% is almond, walnut, cherry and 30% is oak. The fruit and nut wood comes from farmers who are replacing old trees with younger trees or changing crops. The oak comes from agricultural land where the rancher is thinning pastureland. In both cases it is believed the farmer/rancher has the land cleared in exchange for the firewood or pays some net amount to have the land cleared.

Country Boy Firewood, (415) 279-2272

Contact: Louis, manager

This dealer is unwilling to disclose annual sales for competitive reasons. Approximately 30% oak, 20% eucalyptus, 20% madrone, 20% soft woods and 10% other. All of the wood is sourced from arborists and tree trimmers who want to dispose of the wood. He believes substantially all of the trees are removed because they present a hazard or they have already fallen. He does not pay for any of the wood unless it has been cut to size and split, in which case he will pay to cover the cost of that additional service.

1-4

Fessenden Firewood, Hoffman and 30<sup>th</sup> St., Richmond, CA, (510) 236-4789

Bruce Fessenden, manager

This dealer sells roughly 2,500 cords/year. Sales are approximately 50% nut tree wood and 50% Oak. The nut tree wood comes from the central valley and is the result of farmers replacing old trees with younger trees. He believes the farmers come close to break even on the tree removal. The Oak comes from large ranches in the Red Bluff – Redding area. The ranchers thin overgrown woodlands for agricultural reasons. Ranchers also receive approximately \$30 to \$35 per cord. There is no clear cutting that he is aware of. He believes California Dept. of Fish and Game oversees the tree cutting and requires a permit before cutting can take place.

None of the firewood dealers interviewed provided any support for the EIR assumption that for each cord of firewood being burned in the Bay Area there is an equivalent reduction in California’s remnant woodlands. In truth, the survey described above indicates that substantially all of the firewood being sold comes from trees that are being removed for economic and safety reasons that are unrelated to domestic wood burning and would occur in the absence of domestic wood burning. Only the oak coming from northern California results in any remuneration to the landholder and that appears to be a case of sustainably managed woodlands, similar to the situation found in the Australian greenhouse Office study. There is no evidence to support the assumption in the EIR that woodlands are being “reduced” to supply firewood for the Bay Area. The EIR improperly allocated the loss of the trees (and their sequestered CO<sub>2</sub>) to households burning wood for heat. This resulted in a gross understatement of the GHG emissions that would result from the adoption of Rule 6-3. The GHG emission analysis in the EIR should be recalculated with only GHG emissions arising from the cutting and transportation of firewood being allocated to the firewood used for domestic heating.

1-4  
concluded

A second error in the EIR results from the fact that the EIR assumes that there are only two types of wood burning appliances used for heating homes, wood stoves with an efficiency of 70% and fireplaces with an efficiency of 10%. The Australian Greenhouse Office study, upon which the EIR relies so heavily, indicates the efficiency of a fireplace can be significantly better if it is equipped with an insert. The Australian study used the following efficiencies of wood burning appliances: open fireplace 10%, open fire insert 30%, slow combustion insert 60%, non-air tight potbelly stoves 40% and slow combustion stoves 70%. The EIR erroneously assumes all fireplaces have an efficiency of only 10% and the erroneous assumption has the effect of understating the GHG emissions that would result from the adoption of Rule 6-3. The EIR should include a statistically relevant survey of the types of wood burning appliances being used by households so that the efficiencies of those appliances can be accurately calculated.

1-5

A third error in the EIR results from the fact that the EIR assumes that a household heating with a wood burning appliance would use the same number of Btu as that same household would use when it is heating with natural gas. While wood burning appliances are capable of heating only a limited space, natural gas furnaces are typically designed to heat the entire home. When a household that is relying on a wood burning appliance for heat is forced by Rule 6-3 to switch to a natural gas furnace that household may be required to heat the entire home and this would presumably require significantly more Btu of heat. While there are gas-heating appliances that are capable of heating a small space similar to a wood-burning appliance, the EIR unjustifiably assumes they are available to every household. The EIR offers no evidence to support that assumption. The assumption in the EIR that households will require the same Btu of useable heat whether heating with wood or natural gas results in an erroneously low calculation of the GHG emissions that will result from the adoption of Rule 6-3. The EIR should include a statistically relevant survey of households regarding the heating appliances that are

1-6

available and how wood burning and gas heating appliances are used so that the GHG emissions from the adoption of Rule 6-3 can be accurately calculated.

1-6  
concluded

In conclusion, BAAQMD's effort to improve Bay Area air quality through proposed Rule 6-3 is a laudable objective. Whether Rule 6-3 will truly be in the public's best interest can be determined only if the adverse effects from the Rule are accurately assessed. Global warming as a result of GHG emissions is being recognized as an increasingly serious environmental threat that is expected to have an adverse effect on millions of people over multiple generations. Underestimating the extent to which Rule 6-3 will contribute to global warming is a disservice to the public and handicaps well intentioned policy makers. I urge BAAQMD to correct the errors in the draft EIR before proceeding with a final consideration of Rule 6-3.

Robert R. Poindexter  
23 Stetson Avenue  
Corte Madera, CA 94925  
(415) 924-8376

**COMMENT LETTER NO. 1**  
**ROBERT POINDEXTER, CITIZEN**  
**MAY 22, 2008**

**General Response**

The draft EIR concludes that rule provisions prohibiting burning wood on days when air quality is unhealthy would not increase greenhouse gas emissions even though natural gas would have to be burned instead of wood on those days. The EIR reaches this conclusion because (1) the available evidence shows that a significant portion of the firewood burned in the San Francisco Bay Area comes from sources that are not “carbon neutral,” and therefore no different than burning natural gas in terms of greenhouse gas consequences, and (2) much of the wood is burned in inefficient fireplaces<sup>1</sup> that would require large quantities of wood to produce the same heat produced by the relatively efficient burning of natural gas in a gas furnace.

The commenter argues that there would be an increase in GHG emissions because much of the wood comes from activities that would occur regardless of fireplace use, such as thinning of ranch land, tree trimming and removal by arborists, and loss of trees to sudden oak death. But this argument appears to involve a misunderstanding of “carbon neutrality” as it applies to the carbon cycle for trees. Burning wood can be said to be “carbon neutral” when the carbon dioxide released by burning wood is balanced by carbon dioxide removed from the atmosphere through photosynthesis in replacement trees. Only if a harvested tree is replaced by a new tree is there any carbon “credit.” Without this credit, burning firewood increases GHG emissions both when the firewood is harvested (by removing a carbon sequestration mechanism) and when it is burned (by releasing carbon bound up in the wood). Under these circumstances, firewood becomes just another carbon-releasing fuel, except that it typically has lower heating efficiency than other fuels.

Instead of assuming “carbon neutrality” based on tree replacement, the commenter may be assuming that when wood comes from a waste stream that would otherwise go to a landfill, using the wood as a fuel reduces GHG emissions because it replaces natural gas that would otherwise be required. If the commenter is making this waste-stream-diversion argument, the argument relies on a further assumption that burning the wood releases carbon that would otherwise be released in the landfill, and it ignores the significant efficiency difference between burning wood and burning natural gas. However, U.S.D.A. Forest Service scientists have shown that wood deposited in a landfill will remain indefinitely with almost no decay and no release of carbon.<sup>2</sup> In addition, it takes a great deal of wood to generate the same heat as is generated by a small amount of natural gas, given the widespread use of inefficient fireplaces in the Bay Area. As a

---

<sup>1</sup> Of the 1.2 million wood burning appliances in the Bay Area, 1.1 million are fireplaces.

<sup>2</sup> J.A. Micales and K.E. Skog, “The Decomposition of Forest Products in Landfills,” *International Biodeterioration and Biodegradation*, 39(2-3):145-158 (1997).

result, there is no basis for the argument that burning wood diverted from landfills instead of burning natural gas will reduce GHG emissions.

Because there are no simple answers in this area, the EIR relied in part on an Australian study in which scientists sought to model the complex carbon flows in three firewood production systems used in Australia.

### **Response 1-1**

The commenter notes the EIR’s citation of the Australian study and quotes its conclusion that “in terms of limiting GHG emissions, the use of firewood for domestic heating is generally more favorable than the use of other non-renewable sources of energy.” However, the commenter fails to note that this conclusion applies to the specific scenarios analyzed and is not a general conclusion that burning firewood is always better than burning natural gas. The point made in the EIR (see pages 3-30 and 3-31) was that the sensitivity analysis in the Australian study showed that when dead and fallen wood is harvested from remnant woodland, and the wood is burned in open fireplaces, GHG emissions are higher than they are for burning natural gas, even though this wood harvesting is carried out in a sustainable manner. The authors of the Australian study specifically note this aspect of their study:

“Although our results do indicate that using firewood from woodlands was better than most other forms of domestic heating in terms of limiting emission of greenhouse gases, one must be careful when evaluating firewood use from woodlands. This is due to our sensitivity analysis indicating that emission of greenhouse gases would actually be equal to or higher than alternative forms of heating if growth rates were only 70% of our assumptions, and if tree mortality was slightly higher at 1.2% per year, or if the firewood was burnt in an open fireplace rather than in an open fire insert or another type of wood heater.”

### **Response 1-2**

Contrary to the commenter’s assertions, the EIR does not state that the rule would result in as much as 31,900 metric tons of CO<sub>2</sub> annually. Instead, the EIR states that, if burning wood is assumed to be “carbon neutral,” the increase would be of this magnitude. The EIR (see page 3-31) explains how available evidence shows this to be an invalid assumption and how more appropriate assumptions yield a conclusion that the rule would not increase GHG emissions.

### **Response 1-3**

The commenter asserts that the EIR’s conclusion that the rule would not increase GHG emissions is based on the assumption “that all of the wood being used in fireplaces was being sourced by the elimination of woodlands...” and that no basis was cited for the assumption “that woodlands are being eliminated to provide fuel for fireplaces.” First,

this comment appears to reflect the misunderstanding discussed in the General Response above. In determining whether a carbon “credit” applies, it is appropriate to look to whether a harvested tree is replaced by a new tree, and it is irrelevant why the tree was cut down. If oak is being used as firewood in the context of a general decline in oak woodland acreage, one can reasonably assume that a carbon “credit” is unwarranted. The dealer advertising reviewed by the Air District and the dealer survey performed by the commenter document the use of oak<sup>3</sup>, and the studies cited in the EIR document the decline in oak acreage.

Second, the EIR’s conclusion does not rely on an assumption that all wood burned is coming from the elimination of woodlands, and is therefore not carbon neutral. To the contrary, the EIR notes that even if a 40 percent credit is allowed (i.e., assume a reduction in GHG emissions of 40 percent for carbon sequestration by replacement trees), the use of natural gas would reduce GHG emissions, largely because of the significant difference in efficiency between fireplaces and natural gas furnaces. Based on the calculations in Table 3-11 in the EIR, GHG emissions would be higher for wood even if wood is given a GHG credit of 75 percent.

#### **Response 1-4**

The commenter states that his survey of firewood dealers does not support “the EIR assumption that for each cord of firewood being burned in the Bay Area there is an equivalent reduction in California remnant woodlands.” First, as noted in Response 1-3, the EIR does not rely on such an assumption. Instead, the EIR assumes that burning wood is not necessarily carbon neutral and concludes that even if a significant GHG credit is allowed for some portion of the wood supply, GHG emissions are higher for burning wood given the relative inefficiency of wood combustion. The comment appears to reflect the commenter’s assumption that carbon credits accrue because of the wood’s status as “waste” (i.e., it was harvested for reasons other than to supply firewood) and that burning waste wood therefore produces lower GHG emissions than burning natural gas. But, as discussed in the General Response, carbon credits result from the replacement of harvested trees by new trees, and studies show that burning waste wood has much higher GHG impacts than placing it in a landfill.

The commenter’s survey does support an assumption that some carbon credit is appropriate for some sources of wood. For example, if it is true that most wood from nut trees comes from replacement of old trees by new trees, as two survey responses suggest, then burning such wood may be carbon neutral. However, the survey does not support the commenter’s claim that oak involves “sustainably managed woodlands, similar to the situation found in the Australian Greenhouse Office study” in light of the evidence cited in the draft EIR. The Australian study assumes sustainably harvested remnant woodlands, which would mean that there is no reduction in acreage. Even though the

---

<sup>3</sup> In addition, a consultant to the Air District conducted random surveys of Bay Area residents in 2005, 2006, and 2007 regarding wood burning practices. Of those respondents burning natural wood logs, 70% burned oak, while 8% burned almond or fruitwood.

individual examples from the commenter’s survey may involve thinning of oak woodland without a reduction in acreage, the studies cited by the EIR document an overall decline in California oak woodland acreage. The survey data therefore do not alter the conclusion of the EIR that, even if a significant carbon credit is allowed for wood, GHG emissions from burning wood are higher than from burning natural gas.

### **Response 1-5**

The commenter claims that it is an “error” for the draft EIR to assume heating efficiencies of 10 percent for fireplaces and 70 percent for wood stoves. This comment is presumably directed at the Table 3-11 calculation of GHG emissions from burning wood and natural gas. The table includes footnotes explaining that, for purposes of the calculations in the table, wood stove heating efficiency is assumed to be 70 percent and fireplace heating efficiency is assumed to be 10 percent. Because the Australian GHG study used models that allowed use of a variety of efficiency assumptions for fireplaces and for wood stoves, the commenter asserts that reliance on a single figure for fireplaces “has the effect of understating the GHG emissions that would result from the adoption of Rule 6-3.”

The comment provides no basis for doubting the general validity of the assumptions and calculations in the EIR. First, while it is true that fireplace efficiency may be increased by use of a fireplace insert (thereby reducing GHG emissions), the assumed efficiency of 10 percent is almost double the efficiency of 5.8 percent actually measured by Lawrence Berkeley Laboratory in a study that looked at the net heating efficiency of an open fireplace in Walnut Creek, California.<sup>4</sup> It is therefore doubtful that the efficiency assumption for fireplaces overstates GHG emissions for fireplace burning, even assuming some use of fireplace inserts. Second, the EIR assumes an efficiency of 70 percent for all wood stoves despite the lower efficiency of 40 percent noted in the Australian study for some stoves. Conventional U.S. wood stoves have an average efficiency of 54 percent while EPA-certified wood stoves have an average efficiency of 68 percent.<sup>5</sup> Use of the 70 percent figure for woodstoves therefore understates wood stove GHG emissions by overstating their efficiency. As a result, even if fireplace GHG emissions are lower than the calculations show, which the commenter has not demonstrated, wood stove GHG emissions are higher than the calculations show. The calculations in the EIR therefore rely on balanced assumptions in calculating GHG emissions from burning wood in fireplaces and wood stoves, while the commenter would have the EIR make only those assumptions that favor his argument.

---

<sup>4</sup> M.P. Modera and R.C. Sonderegger, “Determination of In-Situ Performance of Fireplaces,” University of California, Lawrence Berkeley Laboratory, report number LBL-10701, prepared for the U.S. Department of Energy (1980).

<sup>5</sup> United States Environmental Protection Agency, AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary, Point and Area Sources, Chapter 1, Section 1.10, “Residential Wood Stoves” (1996).

### Response 1-6

The commenter asserts that in calculating the GHG impacts of prohibiting wood burning on days with unhealthy air quality, it is an “error” to assume that a home would require the same quantity of heat, regardless whether it comes from burning wood or from burning natural gas. The commenter states that wood-burning appliances are capable of heating only a small portion of a house while gas furnaces are typically designed to heat an entire home. The commenter then argues that “[w]hen a household that is relying on a wood-burning appliance for heat is forced by Rule 6-3 to switch to a natural gas furnace that household may be required to heat the entire home and this would presumably require significantly more Btu of heat.” Implicit in this argument is an assumption that those who burn for heat typically turn the gas furnace off and use only a room heated by the fireplace or wood stove. The commenter suggests that the EIR should include a survey regarding how wood burning appliances are used.

The use of behavioral assumptions, such as the one advocated by the commenter, is unlikely to alter the conclusions of the EIR. The assumption proposed by the commenter would apply only to those households that burn wood for heat<sup>6</sup>. Assumptions would also have to be made about those households that burn wood for “ambience” rather than for heat. The Air District conducted surveys in 2005, 2006, and 2007, and the data show that roughly half of Bay Area residents burning wood do so for ambience. For these residents, it is reasonable to assume that the home’s furnace continues to operate during wood burning. As a result, the heat from roughly half of the wood burned would not be replaced by GHG emissions from burning gas, since that gas is already being burned, and not as a consequence of the rule. Relying on this assumption, the EIR would assign no GHG emissions to half of the wood burned for ambience and roughly 15,000 metric tons per year for wood burned for heat (half the amount shown in Table 3-11). The EIR assumption that, in response to the rule, a gas furnace is turned on to replace wood heat in every case is therefore conservative and roughly doubles what the natural gas GHG emissions would be if “ambience” burning is addressed by an appropriate behavioral assumption.

If the commenter’s behavioral assumption is also used (i.e., “entire home” heat quantities from natural gas replace “small space” heat quantities from wood), the GHG emissions from burning natural gas to replace that half of the wood burned for heat would be greater than assumed in the EIR. However, the increase would be unlikely to alter the EIR conclusion that the rule would not lead to an increase in GHG emissions. Emissions would have to go from 15,000 metric tons (assigning zero natural gas GHG emissions for “ambience” burning) to more than the roughly 130,000 metric tons of GHG emissions shown in Table 3-11 for all wood burning. This increase is nearly an order of magnitude and highly unlikely.

---

<sup>6</sup> Note that a very small percentage of Bay Area homes, approximately 1 percent based on 2000 census data, rely primarily on wood for heat. The comment appears to relate to those homes that may burn wood occasionally or regularly in an attempt to reduce the use of natural gas or to reduce energy costs.



The behavioral assumptions are speculative. In particular, the comment offers no evidence to support an assumption that those who burn for heat retreat to one room and turn off the furnace that heats the rest of the home. Though this may be the practice in some households, it may not be common enough as a regular practice to warrant an assumption that applies broadly, particularly given the relatively mild climate of the Bay Area. In any case, if behavioral assumptions are employed, they are unlikely to alter the conclusion of the EIR that curtailing wood burning would not increase GHG emissions.

28 May 2008

Note To: Eric Pop, Air Quality Specialist, BAAQMD

Comments on the Draft Environmental Impact Report (DEIR) on proposed District Regulation 6, Rule 3: Wood-Burning Devices.

Prepared by P. Michael Dubinsky, 695 Posada Way, Fremont, CA 94536

I have reviewed the DEIR on the proposed District Regulation 6, Rule 3: Wood Burning Devices. I do not agree with the provision of the proposed rule which would prohibit the use of EPA Certified equipment (wood stoves) on days which are determined to be Save The Night Time (STAT). My comments on the DEIR which underpin, in part, my views on this unnecessary provision to the proposed rule follow:

**Pages 3-17 & 3-18 – Section 3.1.2.4.** Describes the sources of Ambient Particulate Matter (PM) for the 9 county Bay area that are included in the BAAQMD’s jurisdiction. One source that is not mentioned is PM from foreign sources such as China. I have attached internet links to reports indicating that there is scientific viewpoint and documented evidence that PM travels via air-currents from Asian Countries such as China and impacts the West Coast of the USA.

2-1

The presence of PM from this additional source should be factored into the overall evaluation for impact and relevance. That does not appear to have been done. If PM from non-USA sources represents a significant contributor to the ambient PM then the solution to the concern about ambient PM adversely impacting Bay area air quality may not be found in the proposed rule. In addition my review of the *Technical Report dated April 2008, Sources of Fine Particles* listed among the reference materials for the DEIR cites data from 1999-2001 which makes it outdated and not representative of the current PM load that is present in the ambient air of the Bay area.

**Page 3-24, Table 3-7 Summary of PM Emissions from Wood Burning Devices by County.**

The data depicted on this Table appears to support the concept that fireplaces and not woodstoves are the chief contributor to PM<sub>10</sub> and PM<sub>2.5</sub> emissions. The columns in the Table depicting data of emissions from wood burning stoves does not differentiate between EPA certified and non-EPA certified equipment.

2-2

I see it as logical and in keeping with the objectives of EPA’s certification program for wood stoves to hold the view that if a differentiation was made between EPA Certified and non-EPA certified stoves the actual emission profile would show a lower amount of emissions for the stoves which are EPA certified.

It is my view that the use of EPA Certified wood stoves during STAT designated times would not represent a significant contributor to PM in the air.

**Page 3-26, Section 3.2.3.1** – In this section the stated objective of the proposed rule is repeated, i.e. to reduce the PM<sub>10</sub> and PM<sub>2.5</sub> emissions. Based on the data presented in Table 3-7 it appears that allowing the use of EPA certified equipment would not compromise that objective.

2-3

In addition the first paragraph in this section highlights a logical incongruity inherent in the proposal, i.e. the proposed rule will specify that only EPA certified equipment can be used in new construction or remodeling however that same equipment cannot be used on certain days specified by the BAAQMD.

**Page 3-28, Section 3.2.3.3** – The last paragraph on this page contains more data supporting the view that EPA certified equipment is not the significant contributor to the PM<sub>10</sub> and PM<sub>2.5</sub> in the Bay area. The section states that only 4.5 % of Bay area households own and use wood stoves vs. 36% of households having and using fireplaces. The data also demonstrates that fireplaces are the “device” in which most logs are burned. Fireplaces are therefore the primary source of significant PM.

2-4

However once again there is no differentiation between EPA certified and non-EPA certified equipment which would demonstrate that EPA certified is more efficient in terms of not releasing fine particles into the air.

Thank you for the opportunity to comment on the DEIR.

Air Pollution Articles of Interest.

1. EcoBlog  
[http://blog.lib.umn.edu/tupp0008/environment/2008/03/chinas\\_air\\_pollution\\_an\\_intern.html](http://blog.lib.umn.edu/tupp0008/environment/2008/03/chinas_air_pollution_an_intern.html)
2. China Air Pollution reaches US  
<http://www.cbsnews.com/stories/2006/07/28/ap/national/mainD8J53RV01.shtml>
3. NYTimes article from 2006  
[http://www.nytimes.com/2006/06/11/business/worldbusiness/11chinacoal.html?\\_r=1&oref=slogin](http://www.nytimes.com/2006/06/11/business/worldbusiness/11chinacoal.html?_r=1&oref=slogin)
4. Wood Boilers Cut Heating Bills – Secondhand smoke?  
<http://www.nytimes.com/2006/12/18/nyregion/18wood.html>
5. China’s Next Big Boom could be the Foul Air  
<http://www.nytimes.com/2005/10/30/weekinreview/30yardley.html>

**COMMENT LETTER NO. 2**  
**P. MICHAEL DUBINSKY, CITIZEN**  
**MAY 28, 2008**

**Response 2-1**

The proposed new rule is intended to reduce fine airborne particulate matter from wood burning devices during those days when air quality is at its poorest, which is defined by the rule as forecast to exceed the National Ambient Air Quality Standard (NAAQS) for PM<sub>2.5</sub>. Based on the District's ambient air monitoring network, these days occur during the winter when wind direction is from the east.

Particulates from China are typically at higher elevations, do not impact the Bay Area during days when the District is likely to be in excess of the PM<sub>2.5</sub> standard, and are composed of material other than wood-smoke, namely desert sands and by-products of combustion from coal fired power plants. In addition, the District's air monitoring station along the coast demonstrates that sea salt is predominant on days with wind direction from the west; as stated prior, this occurrence does not coincide with elevated levels of wintertime PM. As such, this source is not a significant contributor to wintertime PM, which is when the District is likely to exceed the NAAQS.

The data used by the Air District to calculate the sources of fine particulate in the Bay Area utilizes the most current data available. The Air District has a network of PM monitoring stations throughout the Bay Area that utilize both, real time and filter analysis, for determining concentrations of fine PM. The Air District utilizes the most current state of the art monitoring methods and equipment in measuring fine PM.

**Response 2-2**

The proposed new rule is intended to reduce fine airborne particulate matter from wood burning devices during those days when air quality is at its poorest. Since all wood-burning devices contribute particulate air pollution during those days when air quality is at its poorest, curtailing use of all wood-burning device types is appropriate. The District is required to meet state PM<sub>10/2.5</sub> standards by the earliest date achievable so all appropriate emission reductions are included.

**Response 2-3**

See Response 2-2 above.

**Response 2-4**

See Response 2-2 above.

From: Mike Martin [mailto:raminduction@vom.com]  
Sent: Monday, May 12, 2008 9:28 PM  
To: Eric Pop  
Subject: draft EIR, Reg. 6 Rule 3

Dear Mr. Pop;

I've read this EIR, and after being assured that those of us in rural areas would be exempt from this onerous regulation, I have failed to see any language to back up the statements made to (yet again) fool the public.

The only wording even close to what your BAAQMD representatives have stated ("those not connected to natural gas would be exempt") is found on page 2-8 of the referenced report in "Burning Curtailment": "An exemption would be provided if wood burning was the SOLE source of heat for a home". Given the weasels we have as politicians and unelected dictators, this is so open to interpretation it is nearly a full employment clause for lawyers, and of course a back door method of screwing everyone outside the urban rabbit warrens.

Do you think that perhaps more specific language might be used so there is no chance for obfuscation, dissembling, and equivocating? Perhaps something to this effect: this regulation does NOT apply to those living outside city limits and in un-incorporated areas that are NOT hooked up to utility provided natural gas.

Yes, this is of great concern to me as I live in a rural area not served by utility provided natural gas. We do have utility provided electricity (unreliable in good weather and even worse in inclement weather), but if a power outage co-incides with one of your STAT situations, I do NOT like the idea that the GESTAPO or KGB will be kicking down my front door and my family experiences a Elian Gonzales, Branch Davidian, Ruby Ridge, or Mormon situation because some self-righteous urbanite or allergy sufferer denounces me for crimes against humanity by having a fire when the power is out in a pc determined STAT event.

A bit of plain English reassurance will go a long ways in this matter.

Sincerely,

Mike Martin  
Sonoma County

**COMMENT LETTER NO. 3  
MIKE MARTIN, CITIZEN,  
MAY 12, 2008**

**Response 3-1**

The rule exempts any person who operates a wood-burning device in an area where natural gas service is not available and does not apply to any person whose only source of heat for residential space heating is a wood-burning device.