

STAFF REPORT

Proposed Amended Rule 207 - *Wood Burning Devices* And Proposed New Rule 208 - *Mandatory Wood Burning Curtailment Periods*

Date of Public Release: November 3, 2008

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Date of Public Release: November 3, 2008

Public Hearing Date: December 11, 2008, at 10:00 a.m.
Chico City Council Chambers
421 Main Street, Chico, CA

Schedule of Meetings

Schedule of Public Workshops:

Monday, November 10, 2008 5:00 p.m. – 7:00 p.m.
Paradise Pines POA, 14211 Wycliff Way, Magalia, CA 95954

Thursday, November 13, 2008 5:00 p.m. – 7:00 p.m.
Chico City Council Chambers, 421 Main Street, Chico, CA 95928

Thursday, November 20, 2008 5:00 p.m. – 7:00 p.m.
Butte County Board of Supervisors Chambers, 25 County Center Drive, Oroville, CA
95965

Date of Board Review and Consideration:

Thursday, December 11, 2008 10:00 a.m.
Chico City Council Chambers, 421 Main Street, Chico, CA 95928

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1.0 BACKGROUND	5
2.0 PURPOSE.....	8
3.0 APPLICABILITY.....	8
4.0 PROPOSED RULE 207 and 208 REQUIREMENTS	8
5.0 COST AND PM2.5 EMISSION IMPACTS.....	8
6.0 SOCIOECONOMIC IMPACTS:.....	11
7.0 ALTERNATIVES:	11
8.0 ENVIRONMENTAL REVIEW AND COMPLIANCE:.....	11
9.0 FINDINGS:.....	11
10.0 REFERENCES	13

Attachment A.	Proposed Amendments Rule 207 - <i>Wood Burning Devices</i>
Attachment B	Proposed New Rule 208 - <i>Mandatory Wood Burning Curtailment Periods</i>
Attachment C	Notice of Public Hearing and Workshops
Attachment D	Proposed Resolutions of Adoption
Attachment E	Cost and PM2.5 Emission Impacts
Attachment F	Photograph of Typical Outdoor Wood-Fired Boiler
Attachment G	District-Approved Zero Clearance Fireplaces
Attachment H	Butte County Residential Wood Burning Map
Attachment I	Butte County Asthma Profile

Rule 207 and 208 Regarding Wood Burning Devices

STAFF REPORT

EXECUTIVE SUMMARY

Proposed Amended Rule 207— *Wood Burning Devices* (formerly named *Residential Wood Combustion*) and new Rule 208 – *Mandatory Wood Burning Curtailment Periods* are being considered by the District’s Governing Board to fulfill State and federal mandates. The California Legislature enacted Senate Bill 656 (SB 656) to reduce public exposure to particulate matter. The goal is to make progress toward attainment of federal and State respirable particulate matter (PM10) and fine particulate matter (PM2.5). The District Governing Board approved an SB 656 Implementation Schedule for Particulate Matter on August 25, 2005. The District is expected to be designated nonattainment for the federal 24-hour PM2.5 standard in December 2008. Residential wood burning emissions have been identified by the California Air Resources Board (CARB) as the most significant contribution to PM2.5. The designation would require the District to adopt an attainment plan. The attainment plan would need to include best available control measures for various PM sources including wood burning devices.

Residential wood smoke reduction was identified as a priority in the Districts SB656 Implementation Schedule. Currently Rule 207 (adopted in October 2001) requires the installation of EPA Phase II certified wood burning devices in new or existing dwelling units (when a wood burning device is installed), prohibits sale or installation on non EPA Phase II certified wood burning devices, requires distribution of educational information about wood burning at point of sale of new wood burning appliances, and prohibits the burning of garbage or use of certain fuels. The proposed amendments to Rule 207 – *Wood Burning Devices* and proposed new Rule 208 - *Mandatory Wood Burning Curtailment Periods* would provide additional emission reductions needed to attain the federal and state PM standards.

1.0 BACKGROUND

Butte County is currently designated as a nonattainment area for the State ambient air quality standards (AAQS) for PM10 and PM2.5. Further, the Chico area does not meet the federal 24-hour AAQS for PM2.5 established in 2006. The U.S. Environmental Protection Agency (EPA) is expected to designate Butte County as a non-attainment area in December 2008. Strengthening Rule 207 - *Wood Burning Devices* and implementing new Rule 208 - *Mandatory Wood Burning Curtailment Periods* will give the District an opportunity to attain the federal and State PM2.5 standards and avoid additional restrictions.

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

- Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing;
- Decreased lung function;
- Aggravated asthma;
- Development of chronic bronchitis;
- Irregular heartbeat;
- Nonfatal heart attacks; and
- Premature death in people with heart or lung disease.

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

Federal Mandates: The new federal PM2.5 standards were effective December 2006, with nonattainment designation expected to be effective in 2009 and attainment plans due by 2012. Emission reductions from wood burning devices are necessary to attain the federal PM2.5 standard. The federal Clean Air Act also requires attainment plans to include transportation conformity budgets which will require that transportation projects to stay within specified emission levels that meet attainment and progress goals.

State Mandates: The District is currently designated as a nonattainment area for the State PM10 and PM2.5 standards. SB 656 enacted by the State legislature and implemented through the California Air Resources Board (CARB) required the state air Districts to adopt an implementation schedule for PM control measures. The District Governing Board adopted the SB 656 PM Implementation Schedule on August 25, 2005. The District PM Implementation Schedule also includes measures to control PM from wood burning devices, residential open burning, and fugitive dust sources including construction, demolition, and grading operations.

Emissions Inventory: Exceedances of the new PM2.5 federal 24-hour standard occur during the late fall and winter months. *Figure 1* presents data from the Chico monitoring site showing the average composition of PM2.5 during 2004 – 2006. *Figure 2* shows the average composition of PM2.5 on fourteen days during this period when Chico exceeded the federal PM2.5 standard.

Burning activities, such as residential wood combustion and to a lesser degree direct tailpipe emissions from mobile sources are major sources of **Organic Carbon**. **Ammonium Nitrate** is formed from chemical reactions of nitrogen oxides (NOx) emitted from motor vehicles and stationary combustion sources with ammonia. **Ammonium Sulfate** is also formed in the atmosphere from chemical reactions of sulfur oxides (SOx) emitted from combustion sources and ammonia. To a lesser extent, **Elemental Carbon** resulting from mobile and stationary combustion sources, and **Geological Material** from roads and other dust producing activities also contribute to PM2.5.

Figure 1

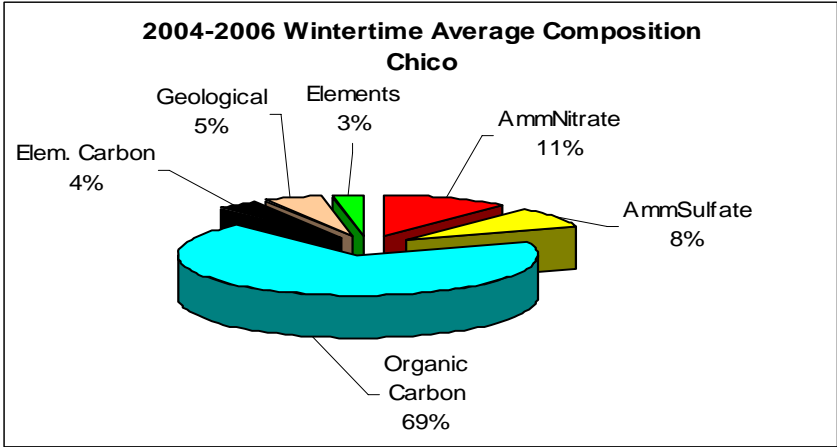


Figure 2

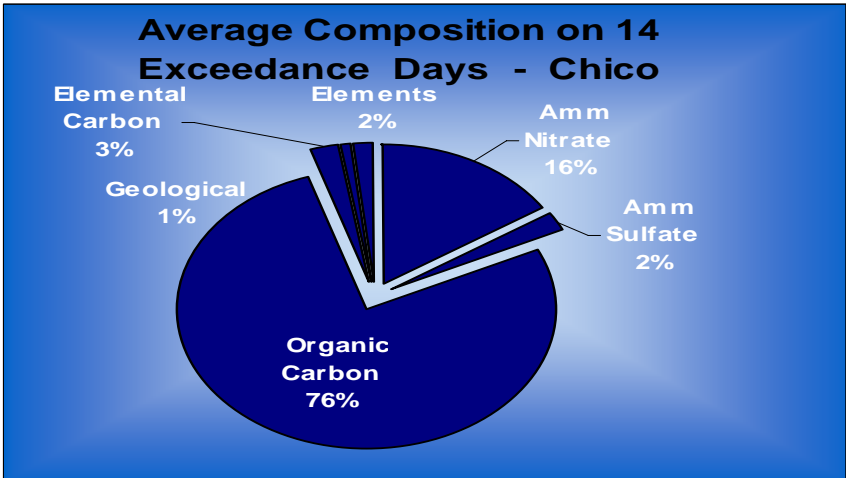
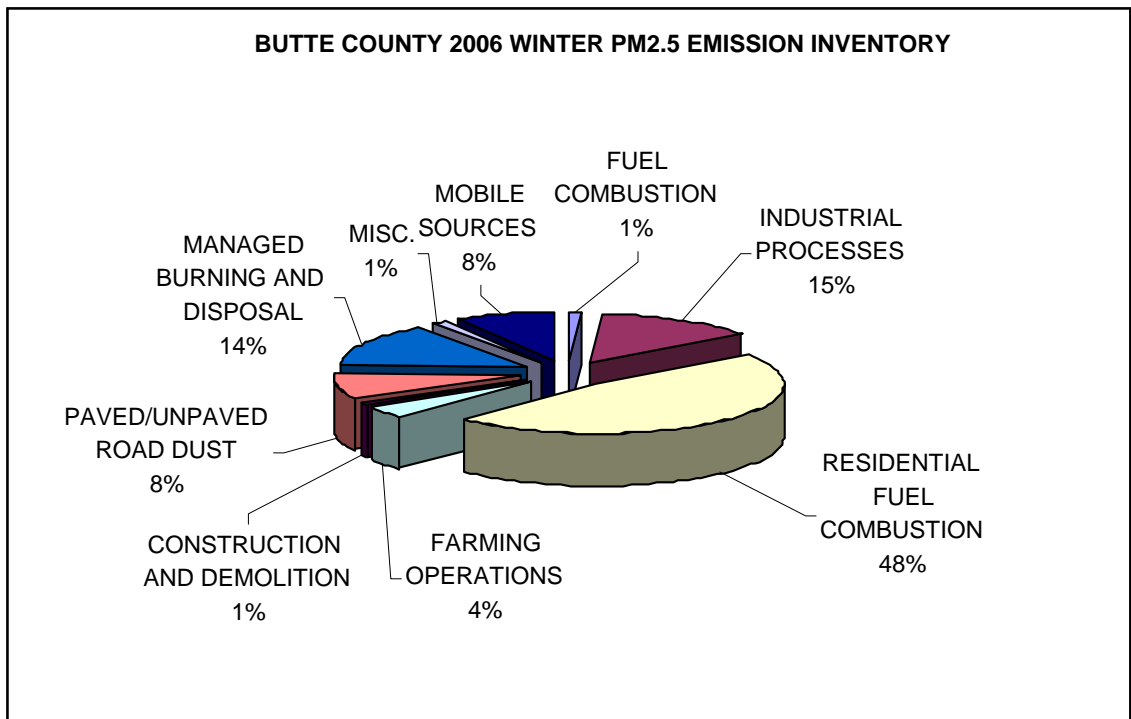


Table 1 shows the 2006 PM2.5 winter emission inventory for specific source categories in Butte County in tons per day.

Table 1 - WINTER PM2.5 EMISSIONS INVENTORY 2006 BUTTE COUNTY	
Source Category	Tons/Day
Residential Fuel Combustion	4.8112
Managed Burning And Disposal	1.4534
Industrial Processes	1.4209
Mobile Sources	0.8631
Paved/Unpaved Road Dust	0.8442
Farming Operations	0.4168
Misc.	0.1432
Fuel Combustion	0.1069
Construction And Demolition	0.0996
Total Winter PM2.5 Emissions	10.1593

Figure 3 shows the 2006 PM2.5 wintertime emissions inventory for Butte County.

Figure 3



2.0 PURPOSE

The purpose of the Proposed Amendments to Rule 207 and Proposed New Rule 208 is to limit emissions of particulate matter from wood burning devices as part of the overall wood smoke reduction program within the jurisdiction of the Butte County Air Quality Management District. Rule 208 would only apply in the Chico Urbanized Area.

3.0 APPLICABILITY

Proposed Amendments to Rule 207 – *Wood Burning Devices* applies within the boundaries of Butte County to any person who owns, operates, installs, builds, inspects, sells or offers for sale a wood burning device.

Proposed New Rule 208 - *Mandatory Wood Burning Curtailment Periods* applies to all High Wood Smoke Areas (HWSA) within Butte County. As proposed, the Chico Urbanized Area is the only area defined as a HWSA.

4.0 PROPOSED RULE 207 and RULE 208 REQUIREMENTS

Proposed Amendments to Rule 207 include minor changes to clarify rule application and adding public awareness requirements for using seasoned wood. The proposed amendment also limit the total emissions from wood burning devices from any interior space in new construction, limits the use of outdoor wood-fired boilers (Attachment F - photograph of typical outdoor wood-fired boiler), and updates the District-Approved Zero Clearance Fireplaces that are not EPA certified (Attachment G).

Proposed New Rule 208 would become effective November 1, 2009 and apply during the months of November through February. Rule 208 would prohibit the use of wood burning devices on poor air quality days as determined by the Air Pollution Control Officer. The mandatory no burn day would only occur in the HWSA (the Chico Urbanized Area). People, who use wood as their only source of heat or do not have access to natural gas would be exempted.

5.0 COST AND PM2.5 EMISSION IMPACTS

No additional cost impacts are expected as a result of proposed amendments to Rule 207 – *Wood Burning Devices*.

Potential cost impacts may be expected with implementation of new Rule 208 – *Mandatory Wood Burning Curtailment Periods*. A business or residence located in the Chico area that chooses to use wood to heat rather than natural gas or electricity can be expected to pay a higher cost during the mandatory wood burning curtailment periods.

A detailed estimate of the potential cost increase and the potential PM2.5 reductions are in Attachment E. The estimate assumes the winter heating season is 120 days (November – February) and the mandatory wood burning curtailment period is estimated to total thirty (30) no

burn days during this period. It is also assumed it will take two cords of wood to heat a typical home in the Chico area for a conventional wood stove and less than that if using an EPA certified wood stove. A summary of the estimates and assumptions are listed in the tables below.

Table 2 gives the estimated fuel costs for a cord of wood, natural gas and electricity. Cost estimates are based on local wood suppliers and PG&E.

Table 2 - Fuel Costs	
Cord of Wood (est.)	\$ 200.00
Natural Gas (\$/MMBtu)	\$ 18.40
Electricity (\$/KWh)	\$ 0.08

Table 3 gives the estimated cost for each of the various fuels for the season equivalent to the heating value of two cords of wood. Also shown are the estimated mandatory wood burning curtailment period totaling 30 days and the associated increase costs. The increase cost per month ranges between \$21 to \$26 for natural gas and \$34 to \$40 for electricity.

Table 3 - Operating Costs Scenarios for Home Heating - 120 Day Season Cost		Mandatory Wood Burning Curtailment - 120 Day Season Cost	
		Increase Cost NG	Increase Cost Elec
Conventional Wood Stove	\$ 400.00	\$ 85.10	\$ 135.80
Certified EPA Wood Stove	\$ 317.65	\$ 105.69	\$ 156.39
Natural Gas	\$ 740.41		
Electricity	\$ 943.21		

Table 4 gives the PM2.5 estimated emissions and reductions for one wood stove during the season in pounds.

Table 4 – Seasonal PM2.5 Emission Impacts (November – February)			
Conventional Woodstove		Certified EPA Woodstove	
Seasonal Emission Estimates PM2.5	Reductions During Mandatory Curtailment	Seasonal Emission Estimates PM2.5	Reductions During Mandatory Curtailment
71.2 (lbs)	17.7 (lbs)	27.0 (lbs)	6.7 (lbs)

Table 5 looks at the estimated number of wood burning devices in the Chico area which could be affected by a mandatory curtailment during poor air quality days. The estimated number of wood burning devices minus the estimated number of households using wood for primary heat equals the estimated potential number of wood burning devices which could not be used (curtailed) on a poor air quality day.

Table 5 – Estimated Number of Wood Burning Devices Potentially Curtailed in Chico	
Estimated Number of Wood Burning Devices in Chico ¹	7,356
Estimated Number of Chico Households using Wood for Primary Heat ²	1,178
Total Estimated Number of Wood Burning Devices Potentially Curtailed	6,178

It should be noted that the estimates in Table 5 are based on available data and only include residence or commercial businesses located in the City of Chico, not the unincorporated areas.

Table 6 – Potential PM2.5 Emissions Reduced in Chico During Estimated Mandatory Curtailment Days (30)	
Total Estimated Number of Wood Burning Devices Potentially Curtailed	6,178
Potential PM2.5 Emissions Reduced Tons/Day	1.26
Potential PM2.5 Emissions Reduced Tons/Season	37.90

In Table 6 the emission estimates assume that an average of conventional and EPA-certified wood stoves are used (no fireplaces which have significantly higher emissions) to simplify the calculations.

Health Impacts and Costs:

As stated earlier, PM is linked to significant health problems. Individuals with respiratory conditions such as asthma are particularly affected. California Breathing, a branch of the California Department of Public Health, produces a County Asthma Profile for each of the 58 counties in California. In Butte County, approximately 29,000 children and adults have been diagnosed with asthma (Attachment I). The profile for Butte County also provides data on the number of asthma hospitalizations reported for children and adults. The number reported uses those individuals who were discharged from Butte County hospitals with the primary diagnosis of asthma. The average costs for these visits (which do not include medications or indirect costs) are presented in Table 7. It should be noted that the emergency room visits reported in the profile are approximately four times higher than hospitalization numbers yet are not included in the associated costs. It is therefore safe to assume that the actual costs associated with asthma in Butte County are significantly underestimated.

¹ Butte County Residential Wood Burning Map (Attachment H) – Source 2008 Butte County Assessor

² U.S. Census 2000 data

Table 7 – Butte County Asthma Health Costs 2006³			
No. of Hospitalizations	Age	Average Charges	Total Costs
47	(0 – 17)	\$11,563	\$563,461
153	(18+)	\$24,309	\$3,719,277

Based on reviews of the latest scientific literature, the Air Resources Board staff has concluded that PM2.5 is much more toxic than previously estimated (reference: ARB Particulate Matter Mortality Staff Report, October 23, 2008). The new research suggests that even small increases in exposure increase the potential for earlier deaths. Every increase of 10 micrograms per cubic meter of PM2.5 creates a ten percent increase in risk of premature death to a person exposed. Annually 14,000 to 24,000 deaths statewide may be associated with exposures to PM2.5.

6.0 SOCIOECONOMIC IMPACTS:

CHSC Section 40728.5 exempts districts with a population of less than 500,000 persons from the requirement to assess the socioeconomic impacts of proposed rules. Butte County population is below 500,000 persons.

7.0 ALTERNATIVES:

The Governing Board may choose to:

- a) Approve the rules as proposed;
- b) Direct staff to modify the proposed rules after receiving public comments during the hearing; or
- c) Take no action.

8.0 ENVIRONMENTAL REVIEW AND COMPLIANCE:

The adoption of Rule 207 and 208 is categorically exempt from the California Environmental Quality Act (CEQA) under Sections 15307 and 15308 of the State CEQA Guidelines and no exceptions to these exemptions apply. This exemption is allowed when the rule will help improve air quality in Butte County. California Public Resources Code (Section 21159) requires an environmental analysis of the reasonably foreseeable methods of compliance. The District has concluded that no reasonably foreseeable adverse environmental impacts will be caused by adoption of the proposed rule.

9.0 FINDINGS:

Findings required by Division 26 of the California Health and Safety Code requires local districts to comply with a rule adoption protocol as set forth in Section 40727 of the Code. This section has been revised through legislative mandate to contain six findings that the District must make

³ California Department of Public Health’s Environmental Health Investigations Branch, California Breathing, Butte County Asthma Profile, July 2008

when developing, amending, or repealing a rule or regulation. These findings and their definitions are included in the *Table 8*.

Table 8 - Findings

FINDING	DEFINITION	REFERENCE
Authority	A district shall adopt rules and regulations and do such acts as may be necessary or proper to execute the powers and duties granted to, and imposed upon, the district by this division and other statutory provisions	California Health and Safety Code Division 26, Part 3, Sections 40001, 40702, and 40716 are provisions of law that provide the District with the authority to adopt these proposed rules.
Necessity	The District has demonstrated that a need for the rule, or for rule amendment or repeal.	The adoption of Rule 207 and 208 are necessary to obtain emission reductions to move closer to the goal of meeting state and federal ambient air quality standards for PM2.5.
Clarity	The rule is written or displayed so that its meaning can easily be understood by the persons directly affected by it	There is no indication, at this time, that the proposed rules are written in such a manner that persons affected by the rule cannot easily understand it.
Consistency	This rule is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or State or federal regulations.	The District has found that the proposed rules are consistent with applicable statutory requirements.
Non-Duplication	The rule does not impose the same requirements as an existing State or federal regulation, unless the District finds that the requirements are necessary and proper to execute the powers and duties granted to, and imposed upon, the district	The proposed rules do not impose requirements that duplicate existing laws or regulations.
Reference	Any statute, court decision, or other provision of law that the district implements, interprets, or makes specific by adopting, amending, or repealing a regulation.	California Health and Safety Code, Division 26, Part 3, Sections 40000 and 40001.

10.0 REFERENCES

1. Sacramento Metropolitan AQMD, Staff Report Rule 421 – Mandatory Episodic Curtailment of Wood Burning Devices, June 29, 2007
2. San Joaquin Valley Unified APCD, Draft Staff Report Rule 4901 – Wood Burning Fireplaces and Wood Burning Heaters), September 5, 2008
3. ARB Emissions Inventory - <http://www.arb.ca.gov/app/emsinv/fcemssumcat2007.php>
4. ARB – Particulate Matter Mortality Staff Report October 23, 2008
5. Washington State Department of Ecology – Outdoor Wood-Fired Boilers
www.ecy.wa.gov/programs/air/AQP_Permits/Boilers/Outdoor_B.
6. U. S. Census - http://www.bcag.org/documents/demographics/2000_census/2000_DP-4.xls.pdf
7. Butte County Assessors Office - Butte County Households w/ Wood Burning Stoves or Fireplaces
8. Department of Commerce – Urban Area Criteria for Census 2000 –
www.census.gov/geo/www/ua/ua_corr2.txt
9. California Department of Public Health's Environmental Health Investigations Branch, California Breathing, www.californiabreathing.org.

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Attachment A

Proposed Rule 207 – Wood Burning Devices

Attachment B

Proposed New Rule 208 – *Mandatory Wood Burning Curtailment Periods*

Attachment C

Notice of Public Hearing and Workshops

*Staff Report
Proposed Amended Rule 207 and Proposed New Rule 208
November 3, 2008*

Attachment D

Proposed Resolutions of Adoption

Attachment E

Cost and PM2.5 Emission Impacts

Attachment F

Photograph of Typical Outdoor Wood-Fired Boiler

Attachment G

District-Approved Zero Clearance Fireplaces

Attachment H

Butte County Residential Wood Burning Map

Attachment I

Butte County Asthma Profile