



**SECOND Summary of Comments Received by the  
Missoula City-County Health Department Regarding the Proposed Revisions to the  
Missoula City-County Air Pollution Control Program**

**For Comments received after July 7, 2009**

**September 10, 2009**

**Chapter 6**

Comment: The emission limits of 0.1 lbs/MMBTU inside the Air Stagnation Zone and 0.2 lbs/MMBTU in the rest of the County for boilers ranging from 1 to 10 million BTU per hour heat input are too strict.

Response: Summarized in the tables below are emission rates required for wood boilers in the United States and small wood boiler stack test results.

**Table 1: Permitted Emission Rates of Two Small Wood Boilers**

Unit	Heat Input (MMBTU/hr)	Pollution Control	Permitted Emission Rate per MMBTU heat input
Foster-Glocester School District - Rhode Island	4.56	High Efficiency Multicyclone	PM <sub>10</sub> : 0.20 lbs PM <sub>2.5</sub> : 0.18 lbs
Mt. Wachousett Community College - Massachusetts	10	Cyclone followed by Fabric Filter Collector	PM: 0.1 lbs

**Table 2: Particulate Matter Stack Test Summary of Small Wood Boilers<sup>1</sup>**

Unit	Heat Input (MMBTU/hr)	Fuel: No Other Air Pollution Controls In Place	Average PM <sub>2.5</sub> Emissions (lbs/MMBTU heat input)	Average Total Particulate Matter Emissions (lbs/MMBTU heat input)
Bismark	1.0	Vegetation & Pallets	0.151	0.199
Darby	3.3	Chips	0.110	0.192
Victor	2.6	Chips	0.098	0.166
Townsend	0.75	Pellets	0.133	0.305

<sup>1</sup>Resource Systems Group Inc. Memorandum dated May 5, 2008

In a draft paper prepared by the Northeast States for Coordinated Air Use Management (NESCAUM) dated 10/9/2008, it is noted that small boilers with capacities of 1.7 MMBTU per hour and greater in Europe that use advanced combustion design with multicyclones achieve total particulate matter emissions between 0.03 and 0.1 lb/MMBTU heat output. Advanced boiler design can include staged combustion, pre-

heated combustion air, oxygen sensors, automated computer controls, moving grate system, etc.

Inside the Air Stagnation Zone, the proposed rule requires that boilers meet the Lowest Achievable Emission Rate (LAER) with maximum allowable emissions of 0.1 lbs/MMBTU heat input. It should be noted that LAER is already required in the PM<sub>10</sub> nonattainment area. So all boilers built in the nonattainment area would already need to meet LAER for particulate matter. Since we are very close to exceeding the daily PM<sub>2.5</sub> standard and PM<sub>2.5</sub> is a regional pollutant, it is reasonable to require LAER for boilers in the larger Air Stagnation Zone. Based on what has been accomplished in Europe with small boilers and the permitted emission rate for the Mt. Wachusett Community College in Massachusetts shown in Table 1, meeting an emission limit of 0.1 lbs/MMBTU heat input is technically possible. Also, as the population in the valley continues to grow, the amount of PM<sub>2.5</sub> that each person can emit on average will continue to shrink if we wish to remain in attainment; therefore the most effective PM<sub>2.5</sub> control measures should be required in the air stagnation zone.

Outside the Air Stagnation Zone the proposed rule would require new boilers to meet Best Available Control Technology (BACT) with maximum allowable emissions of 0.2 lbs/MMBTU heat input. As shown in Table 2 above, average Total Particulate Matter Emissions are below 0.2 lbs/MMBTU for the three non-pellet boilers. These three boilers range in size from 1.0 to 3.3 MMBTU/hour heat inputs; which is in the range that would be covered by this requirement. The test runs with values above 0.2 lbs/MMBTU were the low fire test run for the Bismark boiler and the high fire test run for the Darby boiler. These test results were achieved with no air pollution control equipment. PM<sub>2.5</sub> emissions were below 0.2 lbs/MMBTU for all tests runs done on the non-pellet boilers. These results show that new biomass boilers in the 1 to 10 million BTU per hour heat input range have average emissions that can meet the proposed particulate matter limit.

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Comment: Best Available Control Technology (BACT) analysis should not be required and would incur up front cost.

Response: Outside the Air Stagnation Zone the proposed rule would require new boilers to meet BACT with maximum allowable emissions of 0.2 lbs/MMBTU heat input. Sampling has found elevated levels of PM<sub>2.5</sub> through out the county during the winter months when wood boilers would be most used for heating purposes. It is a reasonable requirement that sources find and implement the cleanest economical methods of building and operating new solid fuel burning equipment in the vulnerable airsheds of western Montana.

With the increased interest in biomass boilers in the United States, it is likely that new economical methods to reduce emission will be found in the near future. Again, at time of construction, it is reasonable that new boilers incorporate what is economically available to control particulate matter emissions.

Note also that Missoula City-County Air Pollution Control Program Rule 6.501(2) already requires permitted sources to meet BACT. BACT analysis, if required, may incur

some up front cost, but the benefits to air quality of clean burning systems will last for years. While sources will always need to meet BACT, this does not mean that all sources will need to do a complete Top-Down BACT analysis. A complete Top-Down BACT analysis would identify all control technologies, eliminate technically infeasible options, rank remaining control technologies by control effectiveness, evaluate most effective controls and document results, and select BACT. Projects that are similar in scope, process and time may be able to use the same BACT analysis. The permitting authority, the Missoula City-County Health Department in this case, decides what BACT is on a case by case basis and a complete BACT analysis may not always be required for a new source.

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Comment: When writing these rules, other issues such as energy cost, climate change and renewable resources should be considered.

Response: Energy cost, climate change and renewable resources have been considered by the department when writing these proposed regulations. While woodstoves, pellet stoves and biomass boilers emit PM<sub>2.5</sub> that can affect the public's health, we recognize that wood burning is an economical renewable energy resource which can have minimal impacts on long term greenhouse gas emissions (i.e. carbon neutral). However, because of winter inversions which trap air pollution in mountain valleys, we have to find a balance between cost, pollution and greenhouse gas emissions that best serves the public interest. The proposed regulations are written with that balanced approach in mind.

Sometimes, a better approach to reduce greenhouse gas emissions is to look at increased efficiencies and renewable energy sources such as wind or solar. Other potentially economical ways to provide heating, besides woodstoves and biomass boilers, include ground source heat pumps, building orientation to the sun, passive heat sinks, or super insulation. Ground source heat pumps are especially efficient when used to heat/cool larger facilities or multiple houses/buildings. If we do allow the installation of woodstoves or boilers that have higher particulate emissions than necessary, the negative impact on air quality and public health could be significant.

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## **Chapter 9**

Comment: The proposed rules create a gap where devices in the 300,000 BTU/hr range cannot meet the 7.5 grams/hr limit and are too small to qualify for the 400,000 to 1,000,000 BTU/hr emission rate category.

Response: To allow devices in the 300,000 BTU/hr range the emission limit of 0.9 or 0.45 grams/10,000 BTU, the department recommends that the range be extended down from 400,000 BTU/hr to 250,000 BTU/hr. Below 250,000 BTU per hour the 7.5 grams/hr emission limit would apply. The largest outdoor wood boilers are around 200,000 BTU/hr; so devices below 250,000 BTU/hr heat input are adequately addressed in the proposed rules.

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Comment: Solid fuel burning devices under 1,000,000 BTU/hr heat input cannot achieve an emission rate of 0.45 g/10,000 BTU heat input unless they only burn pellets; this limit is too strict.

Response: The original limit proposed for small commercial size boilers over 1,000,000 BTU per hour was 0.1 lbs per million BTU heat input. When 0.1 lbs per million BTU heat input is converted to grams/10,000 BTU's, the equivalent emission rate is 0.45 grams/10,000 BTU's. Since the department has recommended changing the emission rate for small commercial boilers to 0.2 lbs per million BTU heat input (Outside the Air Stagnation Zone), the department recommends changing the emission limit from 0.45 to 0.9 grams/10,000 BTU heat input for devices between 250,000 BTU/hr and 1,000,000 BTU/hr. This change will make the emission limit for solid fuel burning devices consistent with the small commercial size boiler emission limit.

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