Response to Comments
On the Proposed Outdoor Hydronic Heater Regulations

MassDEP proposed regulations to establish emission limits, operational requirements and setbacks for Outdoor Hydronic Heaters[1]. MassDEP worked with the Northeast States for Coordinated Air Use Management (NESCAUM – an organization of the air pollution control agencies of the Northeast States) and other states to develop a model regulation that these proposed regulations were based on. *The primary reason the MassDEP proposed to adopt a standard substantially the same as other states is for ease of compliance by the manufacturers. They will not be required to develop different OHH models to be sold in each state. This makes it easier for the manufacturers to comply and should reduce costs for consumers.*

Public hearings on the proposed regulations to control emissions from OHHs were held on June 12, 16, 18, 19 and 23, 2008. Appendix 1 includes a list of those who submitted oral and/or written comment to MassDEP.

MassDEP is adopting the regulations that were proposed, with changes based on the comments received. The following are MassDEP's responses to comments received. Where appropriate, comments have been grouped under appropriate subject matter.

Indoor Installation:

Comment- There is a loophole in the regulatory definition of OWB since these boilers can be installed in a shed or in an occupied dwelling and not be regulated.

Response- The definition of OHH includes those units that the manufacturer specifies for outdoor use or in structures not normally occupied by humans. Therefore, an OHH that a manufacturer specifies for installation outdoors will be regulated even if it is installed in a shed or garage.

Unit Design:

Comment- Commercial units are only based on size and not where they are being installed/used, is this correct?

Response- This is a correct interpretation of the definition of commercial units. Commercial-size units are those that are greater than 350,000 Btu/hr

[1] Outdoor Hydronic Heater (OHH) is a device that is designed to burn wood or other approved solid fuel, designed for outdoor installation or in unoccupied buildings and serves to heat building space and/or water via the distribution, typically through pipes, of a fluid heated in the device, typically water or a water/antifreeze mixture. The terms OHH, Outdoor Wood Boiler (OWBs – generic term often used to describe these units), and Outdoor Wood-fired Hydronic Heater (OWHH – term US Environmental Protection Agency uses to describe these boilers) are used interchangeably in this document. Where possible MassDEP uses OHH.

output and less than 1 million Btu/hr input. The permitting threshold for hand-fed solid fuel combustion is 1 million Btu/hr heat input.

Comment- Are gasification units and wood pellet units subject to this regulation? Another commenter stated that wood pellet units should not be subject to this regulation since they generally have lower emissions than OHHs.

Response- The same requirements apply to wood gasification units and wood pellet units if these technologies are used in an OHH. Such units would therefore need to be certified before they could be sold, installed or operated in Massachusetts after the effective date of the regulations.

Fuel:

Comment- OWBs are not managed well, and prohibited fuels such as garbage, are being burned in some OWBs.

Response- The regulation is clear that only clean wood, wood pellets or other fuel approved by MassDEP can be burned in an OHH. Any person who burns garbage or other unapproved fuels in the OHH is in violation of both the existing Air Quality Regulations and the OHH regulations, once promulgated, and is subject to enforcement action.

Comment- Biomass fuel is renewable energy, carbon neutral, cheap to buy or free if harvested on the property of the owner, and keeps our dollars in the states.

Response- MassDEP is supportive of the use of biomass as an alternative to use of fossil fuels as long as biomass can be burned cleanly. MassDEP is prepared to review different types of biomass fuels for use under this certification program.

Comment- My neighbor obtains his fuel source from his place of employment; presumably for free. This fuel consists of painted and stained wood. I believe burning of this painted and stained wood is exposing my family, particularly my six year old daughter and her infant sister, to toxic fumes on a continual basis. Furthermore, this business is gaining an unfair advantage over its competitors by disposing of this wood waste improperly.

Response- Painted, stained and treated wood are solid wastes and are not permitted to be burned in an OHH. Only clean wood, as defined in the regulation (wood fuel), can be combusted in an OHH. Burning painted, stained or treated wood in an OHH is an activity that is in violation of the current MassDEP Solid Waste Regulations (310 CMR 19.000) and the Air Pollution Control Regulations and is specifically disallowed by the OHH regulations. When such activity is observed, it should be reported to the

local board of health and to the compliance and enforcement program in the MassDEP regional office with jurisdiction over that town or city.

Condition of Air Pollution

Comment – MassDEP received several comments pertaining to emissions from OHHs causing a nuisance or condition of air pollution. Some commenters said that the term "condition of air pollution" is vague and/or difficult to enforce. Some suggested MassDEP adopt a specific standard for ease of enforcement. Some of these suggestions were:

- If the smoke can be smelled offsite, it should be a violation.
- Emissions visible offsite should be considered a nuisance.

Another commenter said that a nuisance standard placed the burden on an abutter to demonstrate that a nuisance existed, and that a less subjective standard would make it easier to make the demonstration.

Other commenters said that MassDEP and local governments needed to have sufficient staff and authority to enforce these provisions to resolve problems.

Response- "Air Pollution" is defined in the Air Quality Regulations and applies to all sources of air emissions. MassDEP agrees that making a determination that something is causing a condition of air pollution requires experience and judgment by MassDEP or local officials that needs to take several factors into consideration. MassDEP and local officials have made such determinations many times in the past, and have successfully enforced this requirement to resolve problems with many sources of air pollution.

An option which MassDEP has utilized in the past (e.g. MassDEP Noise Policy adopted in 1990) has been to establish an objective standard to judge whether a condition of air pollution exists. MassDEP will explore adopting a policy that contains objective criteria which can be used to make a determination that a condition of air pollution exists per se if visible emissions or odor from sources such as OHHs impact an adjacent property or building not being served by the OHH. This will allow easier implementation and enforcement action when the operation of an OHH causes a condition of air pollution. In addition, it should help the owner or operator of an OHH and abutters to determine if operation of the OHH is creating a condition of air pollution. Before adopting this policy, MassDEP will provide an opportunity for public comment on the proposal.

Opacity readings:

Comment- Method 9 for opacity is poorly equipped to deal with the high moisture plume of wood fired heaters. Many certified opacity readers have failed to identify wood appliances as having a "wet plume" or "steam plume" and have erroneously identified such moisture as Particulate Matter. This section of the regulation is unnecessary given the very stringent PM emission limits elsewhere in the rule.

Response- MassDEP follows the Method 9 requirements for reading opacity, and our inspectors have been trained and certified at smoke school to differentiate a smoke from a steam plume. Opacity measurements are a tool MassDEP uses to determine whether a boiler or other combustion equipment is operating properly and not causing a nuisance or condition of air pollution.

Since even an OHH that is certified to meet the emission limits in this regulation can have high emissions due to poor operation or high moisture wood, MassDEP is of the opinion that it is appropriate to retain the opacity limit for commercial-size units and to also apply it to residential size units.

Board of Health Authority

Comment- MassDEP should review the variance terms that a BOH approves to ensure fair and unbiased decisions are made.

Response- MassDEP has amended the regulations to allow only Phase II units be installed after the effective date. Since the variance provision in the public hearing draft only applied to Phase I units, the variance provision has been removed from the final regulation. There is, however, a variance provision that only MassDEP can issue for commercial-size units that cannot meet the setback to the property line.

Comment- Several commenters stated that Boards of Health or other local governing bodies should not be allowed to set emission, efficiency, testing, labeling, fuel use, chimney heights, property line setbacks and opacity standards. The EPA has conducted and published scientific research and town Board of Health members do not generally have the qualifications to supersede the EPA standards.

Conversely, other commenters stated the OHH regulation should clearly state that more owners and operators of OHHs must operate OHHs in compliance with local regulations now in effect or hereafter adopted under M.G.L. c111, §31 or §31c if they are more stringent than the state regulations, including those communities that have banned OHHs.

Response- Local officials are discouraged from establishing different emission limits or testing and labeling requirements as this would make it extremely difficult for a manufacturer to meet different emission standards or labeling or testing requirements. However, with approval from MassDEP, cities and towns may adopt regulations under MGL c 111, section 31C[2] that limit operation or siting of OHHs, as some cities and towns have already done. These local restrictions may be more stringent than MassDEP's regulations and would apply to people installing units in that city or town.

Emission Limit

Comment- Some commenters stated that the emission limits should be expressed as an emission rate in grams per hour. Another commenter asked whether the 15 g/hr limit is a health based standard, noting that it is not part of EPA's voluntary standard.

One commenter stated the g/hr limit for Phase II units is more stringent than the limit for indoor non-catalytic wood stoves since it is a limit on individual test runs and are unnecessary to protect air quality.

Response- MassDEP includes both an emissions limit in pounds per million Btu and an emissions rate limit in grams per hour. The emission limit was chosen to ensure that each OHH is designed and built to meet a minimum standard for emission rate. The emission rate limit was added to limit total loading to the atmosphere from each OHH. The stringency of the limit is discussed in the modeling discussion.

Comment- Some commenters suggested MassDEP should go directly to the Phase II emission limit. Others suggested increasing the Phase II emission rate for one test run from 15 g/hr to 18 g/hr.

Response- In the Background Document for the public hearings, MassDEP asked for comments on whether to proceed directly to the Phase II standards and eliminate the Phase I standards. There was substantial support by commenters to proceed directly to the Phase II standards in order to better protect public health. Since MassDEP initially developed this regulation and published it for public comment, the test results for two OHH models have been reviewed by EPA and listed under its voluntary program on its list of cleaner OHHs. These two models meet the MassDEP proposed Phase II standard of 0.32 lb/MMBtu (The EPA voluntary standard does

[2] C.111, s.31C states: "A board of health, or other legal authority constituted for such purpose by vote of the town or city council shall have jurisdiction to regulate and control atmospheric pollution, including, but not limited to, the emission of smoke, particulate matter, soot, cinders, ashes, toxic and radioactive substances, fumes, vapors, gases, industrial odors and dusts as may arise within its bounds and which constitutes a nuisance, a danger to the public health, or impair the public comfort and convenience."

not contain the 15 g/hr limit for residential units contained in the NESCAUM model regulation and MassDEP regulation.). These two units meet an emission rate limit of 18 g/hr. Since monitored background levels of PM2.5 in Massachusetts are very close to the National Ambient Air Quality Standard (NAAQS), as well as other air quality concerns, and OHHs meeting the phase II limit are available, MassDEP is proceeding directly to phase II emission limits.

The Department increased the maximum allowable emission rate for any test run for Phase II units from 15 g/hr to 18 g/hr. MassDEP believes this limit is still protective of public health and it is also consistent with the NESCAUM model rule and rules in other states.

Comment- Another commenter suggested using the New Source Performance Standard limit EPA established for Residential Wood Heaters (40 CFR 60 Subpart AAA), and since the proposed limits were higher, these emission rates do not represent Best Available Control Technology (BACT).

Response- Simply comparing the emission limits in the NSPS standard (40 CFR 60 Subpart AAA) for residential wood stoves and the proposed emission limit for OHH is not a valid comparison. First, OHHs are generally larger. Second, there are differences in the test methods used for these two different types of appliances.

With regard to Best Available Control Technology (BACT), the limits proposed do not represent Best Available Control Technology (BACT) limits. BACT limits are determined on a case-by-case basis and are established during the permitting process for new or modified equipment. Instead, the emission limits being adopted for OHHs are performance standards being established for a category of equipment that the Department has determined represent a high level of emissions control that can be achieved in practice.

New Boiler Technologies:

Comment- The regulation should provide an incentive to encourage innovation in technology for improved designs and technology that relies on sophisticated, fully automated fuel and air feed to optimize combustion efficiency. This includes controlled air/fuel sensors, and automatic feed for wood pellet fuel. Pellet fuel is nearly bone dry, consistent in composition, and uniform in particle size. When combusted through systems that employ automated fuel and air feed, combustion is nearly 100% and thermal efficiency exceeds 90%. These designs burn much cleaner than the existing conventional units.

Response: The Phase II standard that MassDEP is adopting will require development of more innovative OHH designs that will emit far less particulate matter than existing models in use today do. This will require redesign of units to reduce emissions and improve efficiency in order to meet the standards. MassDEP expects well-designed pellet OHHs to easily meet the proposed standard and at an emission rate possibly significantly below other types of OHHs. This will be reflected in the labeling that must accompany new units before they are sold and will allow the buyer to directly compare emission rates and efficiency and factor those facts into the decision on which unit to purchase.

.

Comment- Can catalyst control technology for particulate matter used in wood stoves be converted to new OWB designs? Would there be similar maintenance issues for catalysts in OWBs as there are with catalysts in wood stoves?

Response- Inclusion of a catalyst to reduce emissions is a possibility. None of the OHHs that EPA has listed on their list of cleaner OHHs has included a catalyst in its design. While catalyst technology is being tested in R&D labs and there have been some tests of preliminary designs in OHHs, the major issue is that since the units cycle on and off, the proper temperature window for catalyst activity can not be maintained without a heating element. This increases the cost and lowers the overall efficiency and technological feasibility of utilizing catalyst technology. MassDEP supports the development of catalytic controls and nothing in the regulation would disallow an OHH owner or manufacturer from installing such technology if it were to become available as long as it was effective and reduced emissions.

Effective Date:

Comment- An effective date of October 1, 2008 for the proposed regulations is unreasonable. Other New England states provided for at least six months from adoption of their statewide regulation to its application and enforcement. A more reasonable and workable date would be April 1, 2009 because many customers have already made plans and financial commitments for this heating season and it would be difficult to change on such short notice.

Another commenter suggested that if an owner puts a deposit on an OHH, but it is not delivered before the effective date of the regulation, the OHH should be considered an existing OHH.

Response- MassDEP intends for the compliance date for installation of new units to be the same as the effective date or date of promulgation of the regulation. Phase II units are available and much cleaner than existing models and

MassDEP wants to reduce the potential impacts from old-design units as soon as possible to reduce the adverse impact from OHHs.

However, in order to mitigate the impact on the public, the final regulation allows OHHs that have been paid for by the effective date to be considered existing OHHs.

Heating Season

Comment- The heating season definition should be consistent with the State Sanitary Code, Minimum Standards of Fitness for Human Habitation, Chapter 2 105 CMR 410.201 to be exclusive of June 15th to September15th. These dates should be included within 7.26(52)(2)(d).

Numerous commenters stated that the April 15th date is too early to end the heating season and that it should extend into May. One commenter stated April 15th is too early for areas in Western Massachusetts with elevations exceeding 500 feet where snowpacks and lower temperatures extend through April into May.

Response- MassDEP extended the heating season applicable in the regulation to May 15th. However, MassDEP believes that the June 15th date used by the State Sanitary Code is too late into the year and unnecessary and would not serve to reduce PM emissions during warmer weather when there is greater likelihood of an OHH causing a nuisance condition.

Installation:

Comment- Installations should be reviewed every 3 years.

Response- If an OHH is properly installed, operated and maintained, it should not be necessary to conduct such a review. However, if a particular OHH is identified to be in noncompliance, appropriate corrective action will be required.

Existing units:

Comment- Several commenters stated that the requirements for existing OHHs were inadequate and that existing OHHs should be required to meet the same emission limits as new OHHs, with one commenter suggesting phasing out existing OHHs by no later than October 1, 2012. Numerous commenters indicated that seasonal limits should apply to existing OHHs. On the other hand, a number of commenters stated that existing OHHs should be grandfathered and no setback, stack height or seasonal limitations should apply to them. A number of commenters stated that not all existing units are causing problems and that those causing a problem

are most likely a relatively small number of the total installed in Massachusetts.

Response- Existing OHHs have caused nuisance problems in a number of different communities. MassDEP has received and continues to receive complaints from neighbors of existing OHHs concerned about their and their family's health as well as concerns about not being able to enjoy their property as a result of smoke.

To better respond to the problems caused by some existing units, MassDEP considered a number of options in drafting the final regulation. As a result of careful consideration, the final regulations, in addition to the operational requirements, rely on a tiered approach to regulating existing units which is outlined in the following table. The tiered approach puts greater restrictions on units that are closer to a neighbor and fewer restrictions on units located further away from a neighbor.

Regardless of where a unit is situated in relation to a neighbor, the regulation makes clear that no unit, wherever it is located, may cause a condition of air pollution.

Stack Height, Seasonal Operation and Setback Requirements for Existing Units

	Public Hearing Draft Regulation	Final Regulation
Existing Units	All existing units limited to seasonal use. No setback requirements Stack height 5 feet higher than roofline of any structure within 150 feet	>500 ft to nearest residence – no limit on seasonal usage and no stack height requirement <500 ft and >150 ft to nearest residence – limited to seasonal use but no stack height requirement <150 ft to nearest dwelling – limited to seasonal use and must meet minimal stack height requirement (2 feet above roofline of any structure within 150 feet)

Comment- We recommend DEP add a section to these regulations allowing owners of existing OHH systems to make changes or improvements to their system without necessitating replacement of the units to comply with 310 CMR 7.26(53) if such changes would make the system more conforming to recommended stack heights or setbacks listed in 310 CMR 7.26(52)(a)2.

Response- There is nothing in the regulation that would prohibit an owner or operator of an existing OHH from making changes that would reduce any adverse impact from the unit.

Comment- Setbacks are needed for existing units. This puts local boards in awkward position to enforce.

Response- The regulations were revised to include a tiered approach where the stack height and seasonal operation standards that apply to existing units will depend on the distance the unit is located from other residences.

Setbacks:

Comment- In the Background Document for the public hearing, MassDEP asked for comments on the required setbacks. A large number of comments were received on this subject.

Some commenters stated the setback requirements would effectively prohibit the installation of either new phase I or phase II OHHs. Other commenters stated that the setbacks proposed for both Phase I and Phase II units were not stringent enough, particularly those for Phase II units.

Response- In response to the comments received, MassDEP has amended the setback and stack height provisions in the final regulation. As noted above, provisions have been added to address existing OHHs using a tiered approach based on how far the unit is from the nearest occupied dwelling. For new units, as noted elsewhere, the regulations will go straight to a requirement for Phase II units since Phase II certified units are now available and emit significantly less particulate matter. Therefore, the regulations addressing Phase I units have been removed from the regulations, including the setbacks that would have applied to Phase I units. The setbacks required for Phase II units have been modified so that a residential Phase II unit must be located 50 feet from the property line **and** 75 feet from the nearest occupied dwelling not served by the unit and a commercial-size Phase II unit must be located 275 feet from the property line and 300 feet from the nearest occupied dwelling not served by the unit.

The following table shows the changes made:

Seasonal Usage and Setback
Requirements for Outdoor Hydronic Heaters

	Public Hearing Draft Regulation	Final Regulation
Existing Units	Only seasonal usage	>500 ft to nearest residence – no limit on seasonal usage and no stack height requirement <500 ft and >150 ft to nearest residence – limited to seasonal use but no stack height requirement <150 ft to nearest dwelling – limited to seasonal use and must meet minimal stack height requirement
Phase I Units	Only seasonal usage. >300 ft to nearest property line and 500 ft to nearest dwelling	Not Applicable since will only allow Phase II units
Phase II Units	>50 ft to property line for residential-size unit. >300 feet to property line Stack height > 5 ft higher than building within 150 ft for commercial-size unit.	>50 ft to property line and 75 ft to nearest dwelling for residential-size unit. >275 ft to property line and 300 ft to nearest dwelling for commercial-size unit. Stack height > 2 ft higher than building within 150 ft for both

Comment- There are no provisions in your regulations for limiting the number of OHHs in a given geographic area nor do you define "population density" limitations for restricting their use entirely.

Response- MassDEP concurs with the commenter to the extent that more modeling is necessary to look at the cumulative impacts of more than one OHH operating in a neighborhood and its impact on public health. For this reason, MassDEP has performed additional modeling to research the ambient concentrations of fine PM in this type of scenario. The modeling results indicate, as expected, that higher concentrations of PM are predicted in an area with more than one OHH. Therefore, MassDEP has amended the regulation to require that units meet the stack height requirement for where a unit is less than 150 feet from another occupied dwelling to prevent downwash affects. In addition, MassDEP has established minimal setbacks for the residential Phase II OHHs such that a new unit cannot be installed within 50 feet of the property boundary and within 75 feet of the nearest occupied dwelling. This will disallow OHHs from being installed in more densely populated areas where they are clearly inappropriate.

Comment- Setbacks should be determined on a case by case basis.

Response- While addressing setbacks on a case by case basis might be ideal, neither MassDEP nor local boards of health have sufficient resources to conduct an evaluation of each installation that could occur across the state. It should be noted that several municipalities require a building permit or other permit prior to installation that would allow the local permitting authority to look at setbacks, but they could not be less stringent than the MassDEP regulations.
A variance provision was provided in the public hearing draft that would have applied only to Phase I units when applying the setbacks. This variance provision would have been administered by local BOHs. There were numerous comments on this provision. However, because the final regulations will require that only Phase II certified units be sold after the effective date, the variance provision has been modified. The regulations now include a variance provision specific to commercial-size units that will allow the applicant to apply to MassDEP for a variance from the setback distance to the property line. The regulations require a commercial-size unit to be located at least 275 feet from the property line and 300 feet to the nearest occupied dwelling or building. A variance will **only** be considered for the distance to the property line and **only** if the size and configuration of the property will not allow a unit to be installed such that it meets the 275 foot distance to the property line. The setback from the nearest occupied dwelling or building remains at 300 feet and cannot be varied.

Stack Heights:

Comment- Stack height needs to be sufficient to prevent a plume from having a downwash effect.

Response- MassDEP has amended the regulations so that stack height of a unit must be two feet higher than the peak of any roof structure (regardless if the structure is or is not on the property being served by the OHH) within 150 feet of the OHH where a residence is within 150 feet of the OHH. The OHH stack height requirement is intended to prevent a nearby building from causing a downwash effect on smoke from an OHH.

Comment- Stack height needs to be higher than the ridges of surrounding houses.

Response- MassDEP has included language that the stack must be two feet higher than the peak of any roof structure within 150 feet of the OHH.

Comment- What if a ranch house is located next to 3-story house and would have to raise its stack to meet the stack height requirement. This seems

discriminatory. This does not apply to indoor wood stoves in this situation.

Response- The reason for the stack height requirement is to prevent the plume from on OHH from being impacted by the nearby structure, which can have a downwash effect on the plume that keeps the smoke in the vicinity and does not allow the smoke to disperse with some velocity. If a 3 story house is located next to a ranch house, then it is highly likely that downwash effects will occur and smoke will not dissipate properly.

Wood stoves generally use the house's existing chimney or a wood stove smokestack, both of which are regulated by the state building code, 780 CMR 6007.

Comment- Need clarification of 310 CMR 7.26(52)(a)(2) "Permanent stack extending 5' higher than the peak of any roof structure located within 150' of the outdoor hydronic heater." – If 500' distance is required for OWB Unit to any occupied building, then there should not be any structures within 150'.

Response- This section in the proposed regulation is not inconsistent since the stack height requirement that the stack extends five feet higher (has been reduced to 2 feet higher in final regulation) than any roof structure within 150 feet applies to any type of building, not just an occupied dwelling. This is intended to prevent any roof structures from interfering with the exhaust gas flow from the OHH smokestack and creating downwash effects that may cause a nuisance condition.

Test method:

Comment- The wood stove test method lets you manually adjust the wood fuel. The test method for OHHs is different than wood stove test method, "not apples to apples in test methodology".

Response- The wood stove and the Method 28 OWHH test methods have different fuel handling requirements. The EPA Test Method 28 OWHH only allows manipulations to the fuel bed prior to the start of the test run in order to achieve charcoalization of the wood while maintaining the desired heat output rate. However, both test methods rely on the same sampling train for measuring total particulate matter (PM). A dilution tunnel is used in the sampling train to capture a representative sample of the total PM emissions that are emitted from the stack, including condensable PM.

Comment- Why doesn't the test method use cord wood since that is what people burn?

Response- In order to develop a test method that is acceptable for testing a particular device that burns a particular fuel, in this case wood, the repeatability and accuracy of testing results are important. The use of dimensional wood that can be stacked in a substantially similar manner from one test to the next was an important consideration. Cord wood does not allow for a consistent loading and stacking methodology due to size variability. The testing with dimensional wood indicated that there was good repeatability in test results relative to cord wood. Although there are claims by the manufacturers that cord wood burns more efficiently in terms of emission rates since dimensional wood is dryer and burns very hot, the purpose of the test method is to achieve high repeatability of test runs so that the test method is proven to be reliable. EPA may consider adoption of the ASTM cord wood test method now under development if the data demonstrates that there is no statistically significant difference in the emission results between the dimensional wood and cord wood fuel protocol methodologies.

Comment- NESCAUM test procedures are not verified by anyone.

Response- With regard to NESCAUM's in-use field testing of an OHH for particulate matter (PM), the testing was done by personnel with expertise in ambient monitoring of PM. The project compared a gravimetric filter PM test method (EPA modified test method 17) with a Thermo Electron DataRAM continuous light scattering measurement test method. Emission characteristics using these two methods were compared and the usefulness of a continuous monitoring system was assessed.

Comment- Averaging does not adequately show real life spikes in emissions which will exceed ambient air quality standards.

Response- The 24 hr NAAQS for $PM_{2.5}$ takes into account short term 1 hour averages. However, instantaneous spikes will not be measured by the ambient PM monitors as suggested by the commenter. If the commenter is concerned about the test method averaging approach, the commenter is correct in that the measurement of PM takes place during an entire charge of fuel to cover the four individual burn rate categories specified in Method 28 OHH.

Comment- NESCAUM has not set up a testing protocol and/or tested any of the wood burning boilers, but simply reviewed data from the state of Vermont test on two units, one of which is a woodchip burner, nor did the State of Vermont test any or all of the remaining units that are out in the market. The proposed regulations require manufacturers to test their units using a third party testing laboratory. Where is the third party testing and review data laboratory for NESCAUM, or Mass D.E.P. to back the review and proposed regulations?

Response- NESCAUM personnel as mentioned above, have proper training, education, and knowledge to properly prepare the testing protocol and conduct the emission testing for the performance evaluation of an OHH.

While NESCAUM has not conducted laboratory testing of an OHH, NESCAUM has conducted a near source ambient emissions field monitoring study. A Thermo Electron DataRAM 4000 performed the monitoring of $PM_{2.5}$. This is a portable nephelometric monitor that employs light scattering to measure the fine particle fraction of airborne pollutants. The DataRAM has the ability to estimate particle size below $PM_{2.5}$ and is an ideal instrument for portable and highly time-resolved applications. The in-use field testing of an OHH conducted by NESCAUM was done by personnel with expertise in ambient monitoring and the use of dilution apparatus for ambient monitoring of PM. A comparison of a gravimetric filter PM test method (EPA modified test method 17) and a Thermo Electron DataRAM continuous light scattering measurement was performed to compare the emission characteristics of an OHH and usefulness of a continuous monitoring system. Testing results were reviewed by EPA, and the NESCAUM states.

Modeling:

Comment- Background emissions in the NY DEC modeling report uses 15 ug/dscm for PM 2.5 when the background ambient concentrations in MA are marginal with meeting the NAAQS of 35 ug/dscm.

Response- MassDEP agrees with the analysis of the commenter. Consequently MassDEP has performed additional modeling runs to predict the concentration impacts of ambient fine PM ($PM_{2.5}$) with the NAAQS relative to the 24 hour standard. The results indicate that requiring setbacks, even for Phase II, where the NY DEC modeling suggests no need for setbacks, is a necessary component to comply with the NAAQS and prevent attendant health impacts that the NAAQS are designed to prevent.

Comment- If there are no units on the market that will meet the Phase 2 criteria then how (what unit and what wood?) was the test done to arrive at the conclusion that Phase II units do not exceed the NAAQS for PM 2.5?

Response- Modeling does not have to use actual test runs from an OWB to predict whether a NAAQS standard will be exceeded. In this case, the proposed Phase II standard was set for modeling purposes at 15 g/hr. The 0.32 lb/MMBtu output standard with no individual test run to exceed 15 grams per hour was used in conjunction with a background ambient concentration of 15 ug/dscm as inputs to the model to determine what

setbacks, if any, would be necessary to prevent an exceedance of the NAAQS 24 hour PM 2.5 standard of 35 ug/dscm. The NY AERMOD modeling results indicated that no case at this set emission standard and background PM 2.5 concentration would exceed the NAAQS standard. The expectation is that the proposed Phase II standard for PM will be technology forcing and will result in improvements to OWB design to meet these standards. MassDEP went beyond the NESCAUM model rule and the final regulation has a 50 foot setback to the property line and 75 feet to the nearest residence, to address Massachusetts' higher background for PM compared to NY and to discourage use of OWBs in more densely populated areas.

Comment- Modeling at 27 ug/dscm does not indicate a NAAQS violation of PM 2.5 so that the 15 g/hr emission limit for residential OWBs should be increased to 18 g/hr to at least match the wood stove standard for a test run.

Response- The regulations were modified to adopt the 18 g/hr standard. The conclusion that an emission rate of 27 ug/dscm does not cause a violation of the NAAQS is dependent on the particulate matter background used in the model. The NY DEC modeling indicates that 20 g/hr is the cap whereby any mass emission rate greater than 20 g/hr in NY would cause an exceedance of the NAAQS for PM 2.5. Using the higher MA background ambient PM 2.5 exacerbates the marginal compliance status within MA for NAAQS for PM 2.5.

Comment- Considering the short-term health impacts from these pollutants, particularly on residents with preexisting respiratory and cardiovascular disease, it is important that the analysis consider reasonable upper-bound exposure conditions. For example, the modeling analysis did not consider increased ground level pollutant concentrations near an OHH unit if meteorological conditions, such as temperature inversions, occur; if the residences near an OHH are located along a roadway, or if multiple OHH are operating in close proximity in a neighborhood.

Response- MassDEP agrees with the commenter and has looked at further modeling runs that take into account multiple OHHs operating in different configurations. The results confirm that a minimal setback even for the Phase II OHH is advisable for $PM_{2.5}$ attainment purposes and to protect respiratory and cardiovascular health that the NAAQS $PM_{2.5}$ standard was developed to protect.

Health Impacts:

Comment- Averaging does not adequately show real life spikes in emissions which will exceed ambient air quality standards.

Response- The 24 hr NAAQS for $PM_{2.5}$ takes into account short term 1 hour averages. However, instantaneous spikes will not be measured by the ambient PM monitors as suggested by the commenter.

Comment- MassDEP findings reflect the nearly unanimous opinion of public health professionals that the smoke from these boilers contains dangerous particulate matter, toxic compounds, and potential carcinogens. The logical conclusion from these findings must be that the use of the existing units should be banned.

Response- MassDEP agrees to a certain extent with the commenter that existing units may pose a greater risk of health impacts, depending on how they are operated, the fuels burned and how far a unit is from neighbors. Instead of a complete ban on the existing units, MassDEP has developed a tiered approach for existing units to reduce the chance that an existing unit would cause a condition of air pollution. Units greater than 500 feet from another residence may operate during the non-heating season and do not need to meet the stack height requirement. Those units greater than 150 feet from another residence but less than 500 feet may only operate during the heating season but do not need to meet the stack height requirement, while those units less than 150 feet from another residence may only operate during the heating season and must meet the stack height requirement to avoid downwash effects.

Comment- There was no testimony by doctors regarding the increase of illnesses related to OWB's.

Response- A number of public health professionals, including the Massachusetts Department of Public Health, commented on the proposed regulations. Furthermore, based on a literature review by MassDEP, the following conclusions can be drawn: OHHs are a source of significant $PM_{2.5}$ contamination (Johnson 2006)[3]. OHH pollution is exacerbated because the low stack design does not allow the smoke to disperse effectively. Johnson (2006) shows that release of emissions from a residential OHH can produce episodes of very high ambient levels of $PM_{2.5}$. Human exposure levels are dependent on: operating conditions of the boiler; type of fuel; time elapsed from the addition of fuel to the boiler; local weather; and activity patterns and location of those living or working nearby. These parameters and topography will determine the amounts of emissions inhaled (Brown 2007)[4]. Current ambient exposure episodes to $PM_{2.5}$ in the Northeast U.S. increase hospitalization rates for cardiovascular and

[3] Johnson PRS 2006. In-field ambient fine particle monitoring of an outdoor wood boiler: exposure and public health concerns. Human Ecol Risk Assess 12:1153–70

[4] Brown, David R., Callahan, Barbara G. and Boissevain, Andrea L. (2007) 'An Assessment of Risk from Particulate Released from Outdoor Wood Boilers', Human and Ecological Risk Assessment, 13:1, 191 - 208

respiratory disease. More specifically, some of the well established health effects of *ambient particulate matter* include the following:[5]

1. Epidemiology studies report increased cardiovascular events, exacerbation of asthma, and chronic obstructive pulmonary disease as well as links to cancer (Pope *et al*. 2002).
2. Case report studies show increased admission to emergency rooms for both respiratory and cardiovascular events.
3. Some clinical studies demonstrate a protective effect for anti-inflammatory medications.
4. Statistical analyses of some national mortality data show an increase in mortality in areas with higher particulate materials in the ambient air.

Comment- The MADEP needs to stop ignoring the research and admit that the emissions from boilers create the "new second hand smoke" that is more dangerous than cigarette smoke. This is supported by the work of researchers such as David Brown, James Repace and others. Even the MA DPH has pointed out the "limitations" to your report.

Response- MassDEP has not ignored research on wood smoke. The purpose of this regulation is to put in place stringent emission standards that will require manufacturers to greatly improve the design of the OHHs they want to sell in Massachusetts as well as improve the efficiency of such units. The success of this approach is evident in that several manufacturers have already made improvements to the design of some of their OHHs.

Comment- The human health hazard is incompletely assessed in the Background Document and the assessment is incorrect. The use of the EPA reports and the NESCAUM report is predicated on an assumption that the NAAQS 24 hour PM 2.5 is protective of respiratory and cardiovascular inhalation hazard at local settings. It is not. A 24 hour standard fails to capture the hazard from the fumigation of local neighborhoods that occurs during 25% of the days in the northeast. The actual human respiratory and cardiovascular attacks from particulate matter and wood smoke emissions are induced by exposures of two hours or less.

Response- MassDEP agrees that a 24 hour ambient PM standard may not be sufficiently protective of respiratory and cardiovascular inhalation hazards in local settings and over short periods of time. The EPA NAAQS is a 24-hour average value which is not based on capturing minute by minute or hourly peaks. The measurement method provides an integrated 24-hour value, but does not provide information on short-term concentrations and potential short-term exposures. All states depend on EPA to develop NAAQS that are protective of public health for states to use in strategic

[5] (USEPA 2006; Burnett *et al.* 2000; Delfino *et al.* 2002; Dockery 2001; Steib *et al.* 2003):

planning so they can come into attainment with criteria pollutant standards, including PM_{10} and $PM_{2.5}$. That said, standards for shorter duration exposures have not been adopted by either EPA or MassDEP.

Comment- During periods of fumigation, elevated stacks will not protect the neighborhood. Very high levels of PM are reached at nearby houses. The heating systems in the nearby houses draw the fumes into the house creating a very high level of particulate and wood smoke within the house that persists for several hours. Neither the Phase I nor the Phase II output levels proposed has been demonstrated to protect against this intrusion of wood smoke into nearby homes.

Response- If there are not adequate setbacks, then an abutting neighbor may be exposed to infiltration of wood smoke into their house. The goal of establishing setbacks and stack height requirements is to prevent downwash effects and reduce the level of infiltration that could occur.

MassDEP will now require, as noted elsewhere, that only Phase II units be installed after the effective date of the regulations. Phase II units will emit substantially less smoke than units that have already been installed, which should reduce the amount of infiltration that could occur. In addition, emission limits have been modeled and demonstrate that with stack height requirements in place, and compliance with the stringent output based emission limit in conjunction with the g/hr applicable emission rate, smoke should be considerably reduced outside the house to the extent that it should not be detected within a house when the unit is operated in accordance with best burn practices.

Comment- Regulators have incorrectly designated a public health hazard as a nuisance. DEP must characterize the actual conditions that exist in the state. Lists of complaints do not do this, also the NESCAUM analysis does not consider complaints and the seriousness of the health effects that are currently occurring. Persons are abandoning their homes, some on the advice of physicians. A public health emergency has been demonstrated by the local boards of Health. The complaints and health effects from people exposed to the OWB emissions are completely consistent with the known effects of wood smoke and particulate matter.

Response- MassDEP concurs with the commenter that some OHHs have caused more than just a nuisance and in fact some home owners have moved to avoid the health impacts from these units. Given the numerous complaints and calls made to MassDEP relative to health issues associated with living near an OHH, MassDEP takes the matter seriously and has worked with other states and EPA to help develop a test method and write a technology driven, stringent PM output-based standard, now reflected in the OHH regulations. This standard is designed to minimize potential impacts.

Comment- The regulations only look at particulate matter and do not consider other carcinogens from wood smoke such as, but not limited to, formaldehyde, dioxin, furans, volatile organic compounds, or poly aromatic hydrocarbons.

Response- Fine particulate $PM_{2.5}$ is of greatest concern because it is linked to asthma, chronic obstructive pulmonary disease (COPD), cardiac effects, and lung cancer (review by Naeher *et al.* 2005)[6]. In the research paper, "Changes in Lung Function and Airway Inflammation Among Asthmatic Children Residing in a Woodsmoke-Impacted Urban Area" by Ryan Allen et al, it is suggested that lung function may be especially sensitive to the combustion-generated component of ambient $PM_{2.5}$, whereas airway inflammation may be more closely related to some other constituent of the ambient $PM_{2.5}$ mixture. More research is necessary to quantify the emissions of formaldehyde, dioxins, poly aromatic hydrocarbons, and other toxics that are components of wood smoke to evaluate the potential health risks of exposure to wood combustion.

Comment- The regulations do not go far enough, literally, to protect the public. The MA DEP will create two classes of citizens, a special protected class allowed to pollute the environment and harm neighbors, then a second class, who will pay the cost of the neighbors' boiler in terms of the health risks, increased health care costs, and loss of property values.

Response- MassDEP is responding to this health issue by developing a stringent regulation that will control both existing and new installations where no regulations specifically regulate OHHs today. By going directly to Phase II standards for new installations, the regulations will be technology forcing and will require manufacturers to develop much improved OHHs that emit significantly less smoke and operate much more efficiently.

For existing units, MassDEP is requiring a tiered approach, as outlined elsewhere in this document, designed to put greater requirements on units located closer to a neighbor that are likely to cause more problems, including stack height requirements and seasonal restrictions on operations. In addition, the regulations make clear that no OHH, no matter where it is located or whether it is a new or old model, may cause a condition of air pollution.

[6] Naeher LP, Smith KR, Brauer M, *et al.* 2005. Critical Review of the Health Effects of Wood Smoke. Health Canada, Ottawa, ON, Canada

Agricultural Impacts:

Comment- Dairy operations have a 35% market penetration in MA. OWBs are used for milk processing operations. There are grants in state to protect agricultural operations and this rule is in conflict with those incentives.

Response- MassDEP supports protection of agricultural operations, but not at the risk of public health. The potential public health impacts of OHHs are the same, whether used in a residential setting or on a farm, if a neighbor is impacted by a unit. As noted elsewhere in this document, MassDEP has modified the final regulations by clarifying that existing units used at locations that are greater than 500 feet from the nearest occupied dwelling not served by the unit may continue to operate year-round and without meeting the stack height requirement, whereas units sited closer to other houses will be further restricted. In any case, no unit, whether an existing unit or a new one, may cause a condition of air pollution or a nuisance.

The regulations include a variance provision specific to commercial-size units that will allow the applicant to apply for a variance from the setback distance to the property line. The regulations require a commercial-size unit, which some farmers may be interested in using for their operations, to be located at least 275 feet from the property line and 300 feet to the nearest occupied dwelling or building. A variance will **only** be considered for the distance to the property line and **only** if the size and configuration of the property will not allow a unit to be installed such that it meets the 275 foot distance to the property line.

Comment- There may be a place for OWBs in certain agricultural circumstances where a farmer has enough land to place a unit far from other properties. Any such use should be by special permit only, and with substantive and procedural protection for the neighbor's rights. No such permit should be granted until after a public hearing with notice of the hearing given by publication and by mailing to all abutting landowners and residents within 1,000 feet of the applicant's property. The burden should be on the applicant to prove by clear and convincing evidence that no condition of air pollution will result beyond the applicant's property line, preferably by some measurable criterion. If all conditions are so proven, the unit would be allowed only if setback and stack height requirements at least equal to the Phase I requirements are met. There should be no variance from these requirements. There should be a provision for appeal by an abutter to the DEP or to the district court or both.

Response- MassDEP agrees there are certain applications of an OHH on a farm setting that may be appropriate. Clearly, sufficient setbacks to property lines is one approach. Stack height requirements is another approach. As explained elsewhere in this document, MassDEP has developed a tiered

approach for existing units that requires more controls for units closer to another residence than for units further away. In any case, no unit, whether an existing unit or a new one, may cause a condition of air pollution or a nuisance.

Comment- The Board of Health in Westminster is in favor of allowing exceptions to the seasonal limitations for agricultural use as long as the Phase I setbacks and stack heights are met.

Response- MassDEP has developed a tiered approach for existing units based on distance from the nearest occupied dwelling that will apply to all existing OHHs.

Heating season vs. Year round certification:

Comment- OWBs should be able to be certified for year round usage for Phase I compliance.

Response- MassDEP has decided, since there are units available that meet Phase II standards, to revise the proposed regulations by going straight to the Phase II standard effective November 1, 2008. This will have the advantage of achieving significant PM emission reductions and mitigating PM-based nuisance and health issues that may have been otherwise produced by the operation of Phase I units. In addition, MassDEP has modified the certification standards to allow units to be certified for both year-round or heating season only use.

Seasonal restrictions:

Comment- OWBs should only be operated in the heating season.

Response- With regard to existing facilities, the regulations have been amended to establish a tiered approach. Units located greater than 500 from another residence may operate year round, but units less than 500 feet may only operate during the heating season. Certified Phase II units may operate year round.

Comment- The seasonal restrictions should not apply to existing units.

Response- Most of the complaints that the MassDEP has fielded involve older units that use older technology, particularly if they are operated during the summer months when people open their windows and their children are outside. Since these existing OHHs are not using advanced combustion design and generally emit much higher levels of particulate matter and other pollutants than new units currently being tested for certification by EPA, these existing units should have greater restrictions placed on their

operation so as to minimize potential impacts. Therefore, seasonal restrictions will apply to existing units if they are located less than 500 feet to another house. This allows the owner to heat his house when most needed, but eliminates smoke at the time of year when people are outdoors in their yards. It should also be noted that for Phase II units there are no seasonal limitations on operation.

Comment- The seasonal restrictions for Phase I units will not allow heating of pools and domestic hot water.

Response- MassDEP has amended the regulation to require that only Phase II units be sold and installed in Massachusetts after the effective date. Two units designed by two different manufacturers already meet the Phase II standards and more will be certified soon. The seasonal restrictions do not apply to Phase II units.

For existing units that are not Phase II units and are less than 500 feet from a neighbor's house, the seasonal limits will apply in order to protect neighbors from the effects of smoke during the warmer months when they are more likely to be outside using their property or have their windows open. This will mean that heating of pools and domestic hot water using existing OHHs located less than 500 feet from another house will not be permitted unless the OHH is a Phase II certified unit. There are other options available for domestic hot water and pools.

Comment- Section 52(d) of the proposed Massachusetts Regulations is also unnecessarily and harmfully restrictive. A blanket seasonal limitation should not apply to OHH's that are not in a genuine nuisance situation. For those OHH's that actually do create a nuisance due to proximity and other factors, a burning restriction beginning on May 15th and ending on September 15th would be more reasonable. Such a restriction would allow for a relatively full heating season for those citizens of the Commonwealth dependent on OHH's in this era of escalating oil prices.

Response- The regulation has been modified based on a tiered approach for existing units that places greater restrictions on existing units located closer to neighbor's houses than ones that are further away. In addition, the length of the heating season was extended to May 15.

The regulations will require that only Phase II units be solid after the effective date of the regulations. These cleaner units should have greatly reduced emissions as well as operate more efficiently. Phase II units will be allowed to operate year-round.

Comment- We have always believed that using a renewable resource (scrap wood/pallets) in the curing process of our manufactured products is the

prudent path to follow. We urge the state of Massachusetts to allow the burning of scrap wood throughout the year in the manufacturing process.

Response- To burn scrap wood year-round in a manufacturing process requires that:

- The scrap wood is clean wood, as defined in the Air Quality Regulations (no paints, stains, varnish or other coatings or treated)
- The OHH is certified as a Phase II unit, which will allow for year-round operation
- The OHH meets the associated setbacks for residential or commercial units, as applicable. If the unit is an existing unit, it must be greater than 500 feet to the nearest occupied dwelling or building.

Comment- Open burning is January 15th – May 15th and people burn leaves which is not allowed but happens, and farms open burn year round.

Response- The Air Pollution Control Regulations, at 310 CMR 7.00, state that open burning season is January 15 through **May 1**, given that approval from the local fire administrator is granted and there are no prevailing meteorological conditions for not granting permission. Burning of leaves is not permitted and enforcement action would be taken if witnessed or documented by MassDEP. There is an agricultural exemption for open burning for brush and trees strictly for land clearing operations for agricultural purposes.

The definition of heating season in the OHH regulations was modified to extend the heating season from October 1 to May 15.

Comment- Our town voted to let families with these units burn them all year if they wanted to for hot water. It would be a hardship and a lot of work not to. You cannot just turn this machine off. It requires chemicals and draining 150 gallons of water and you can't turn this off in cold weather the pipes will freeze underground.

Response- Existing units that that are greater than 500 feet from the nearest occupied dwelling or building may operate year round. Existing units that are less than 500 feet to the nearest occupied dwelling or building may only operate during the heating season so as to reduce potential impacts to neighbors. New OHHs that meet the Phase II standard may also operate year round.

Safety:

Comment- Installing these boilers outside is safer than wood stoves or other heating sources installed and operating within a residential building.

Response- OHHs installed outside may be safer than indoor wood stoves from a fire safety perspective. However, OHHs are larger, generate more particulate matter than indoor wood stoves and release that particulate matter closer to the breathing zone of people and therefore may pose a threat to the health of neighbors if the unit is not properly operated or is too close to another resident. Therefore, the final regulations will require that only Phase II units be installed going forward.

Interaction with EPA Voluntary Program:

Comment- Which hangtag provisions should be used, EPA or the state's?

Response- EPA has now adopted Phase II limits in its voluntary program. The hangtag provisions of that EPA program and the MassDEP requirements are consistent. Therefore, a manufacturer following the EPA hangtag requirements will meet the MassDEP requirements.

Comment- Outdoor hydronic heaters need to be installed and labeled according to all applicable MA state codes, including but not limited to boiler code 522 CMR and 780 CMR gas code and labeling in accordance with ASME codes.

Response- MassDEP agrees that all applicable Massachusetts state installation and labeling requirements relative to the installation of an OHH must be followed during installation. The regulations were amended to refer to those rules.

Comment- The rules are inconsistent with the U.S. EPA OHH program, which will discourage further involvement in the U.S. EPA's program and unnecessarily complicate multi-state and interstate OHH sales.

Response- The regulations were developed based on the NESCAUM model rule, which was developed with participation from EPA and the NESCAUM states. EPA's voluntary program will soon also have a Phase II program and therefore be largely consistent with Massachusetts' regulations.

Comment- The draft rule would require a quality assurance program involving both physical inspection of one in every 150 units produced, by an independent contractor, to determine if applicable tolerances have been maintained or if changes in materials affecting emissions have occurred as well as periodic independent emissions testing of production units. The draft rule and the U.S. EPA OHH Program already require re-testing whenever there is a change in tolerance or materials affection emission limits.

Response- MassDEP and other NESCAUM states are relying on EPA's ETV program for quality assurance purposes. ETV will serve an important

function in verifying that the accredited labs are adhering to the test protocols and submitting accurate testing data. MassDEP has amended the Quality Assurance Program section of the regulation to require the manufacturer to undertake the quality assurance measures, including PM testing of an OHH based on production rates and emission levels by accredited labs only when the ETV program is **not** overseeing compliance testing of OHHs.

Comment- The draft rule would require that emissions test data be reviewed in accordance with the U.S. EPA's Environmental Technology Program or by an independent contractor approved by DEP. However, neither U.S. EPA nor any other state requires such a review for OHHs or any other wood burning appliances.

Response- MassDEP disagrees with the commenter, as other NESCAUM states, including ME, will be relying on EPA's ETV program for verification of the testing procedures and emission reports submitted for certification. The commenter is, however, correct that ETV is not being used for wood stove quality assurance purposes.

Consistency with states:

Comment- Chapter 150, (of the ME Board of Environmental Protection) calls for boilers to have a 500 foot setback for schools, daycare and hospitals. A commercial boiler has to have a 400 foot set back from a residence. Such set backs are noticeably absent in the MA DEP regulations. The MA DEP needs greater residential set backs and greater set backs to schools and hospitals.

Response- In April 2008, the Maine Legislature enacted Resolve Chapter 190, Regarding Legislative Review of Portions of Chapter 150: Control of Emissions from Outdoor Wood Boilers, a Major Substantive Rule of the Department of Environmental Protection, Bureau of Air Quality Control. This legislation amended Chapter 150, including the setback requirement from state licensed schools, daycare or healthcare facilities so that the setbacks conform to the general setback requirements. Consequently, the final language of the regulation was modified to be consistent with the general criteria.

The Massachusetts regulations have focused on distances to people's homes, since there is a higher likelihood of exposure to wood smoke from OHHs in that scenario. The regulations have established different setbacks for residential-size units (50 feet to the property line and 75 feet to the nearest occupied dwelling not served by the unit) and commercial-size units (275 feet to the property line and 300 feet to the nearest occupied dwelling not served by the unit.

General Comments:

Comment- The draft rule has an effective date of October 1, 2008 and does not include a "sell-through" exemption for OHHs in dealer inventory as of that date. Massachusetts DEP should adopt a "sell through" exemption similar to that adopted in Maine which permits dealers to sell OHHs that were in inventory as of the effective date of the rule during the year that follows the effective date.

Response- MassDEP prohibits the sale of OWBs that are not Phase II certified as of the effective date of the regulation. It is MassDEP's understanding that existing inventory is not large and that there is a waiting list for new units. MassDEP will also notify dealers located in the state of the impending regulation publication date as soon as possible before they are published so that they will be able to inform customers and prepare for selling Phase II units if they are not already selling them.

Comment- With the heating crisis in full swing, we do not feel it is the appropriate time to tell people they cannot have outdoor wood burning as an alternate heat source. Buying an outdoor boiler was a perfect solution for us since we have a large supply of wood and that is a huge savings for us since we do not have to purchase fuel oil.

Response- MassDEP is supportive of wood and other biomass combustion technologies for home heating purposes. The regulation does not disallow OHHs as an alternative heat source. However, with the high number of nuisance complaints and observations conducted by MassDEP inspectors and local BOHs confirming these reports as true, developing emission standards with setbacks and stack height requirements was a reasonable and necessary step to protect public health and prevent nuisance problems from developing. Fine particulate is a proven health hazard, and the fact that existing OHHs emit fine particulate, in many cases at very high levels, makes it incumbent upon MassDEP to draft regulations to protect public health. Furthermore, Phase II units are now on the market and available.

Comment- Rules should address bad actors and not the good actors burning clean wood and operating unit according to manufacturer's specifications.

Response- The final regulation does exactly as the commenter suggests. The rules address bad actors and allow those units not causing a condition of air pollution to continue to operate, with some restrictions on operations based on proximity to other occupied dwellings and with fewer restrictions on new Phase II units which should operate much more cleanly than those models currently in use. Operators burning clean wood in an OHH designed to combust efficiently and effectively according to the

manufacturer's specifications and the siting requirements should be minimally impacted by the regulations. Operators currently causing problems may need to burn clean wood, change their burn practices, increase stack height and/or purchase phase II certified units to mitigate the impact. There may be some operators who will need to cease operating an OHH if it is causing a condition of air pollution and the problems cannot be solved.

Comment- There should be a health based or temperature based advisory so that the OWBs are not operated on these days.

Response- This is a very good suggestion that MassDEP considered. However, MassDEP decided that the implementation of such advisories and enforcement of this requirement would be difficult. The requirement for installation of Phase II units after the effective date should result in much cleaner units being sold.

Comment- There should be an incentive to upgrade to a cleaner unit provided by the manufacturer or by the state as a boiler change out program.

Response- Wood stove change-out programs have been very successful in other parts of the country to replace old wood stoves with much cleaner certified models. MassDEP encourages manufacturers to provide an economic incentive to upgrade to a cleaner unit as a strategy to phase out existing units.

Comment- MA DEP should require an emission rate warranty for a minimum of a five year period, if not for the life of the unit. Failure to meet the required emission warranty will result in a refund to the owner.

Response- A requirement for a written warranty provision to achieve an emission rate for a certain period of years has not been included in the regulations. However, if repeated nuisance or opacity violations are observed, the MassDEP may request a commercial unit to be retested in accordance with 310 CMR 7.26(54)(g)7.

The certification of a particular model is valid for a five year period. MassDEP may request a model to be tested for certification purposes if any of the conditions cited in 310 CMR 7.26(54)(e) or (f) relative to a design or material change has occurred. Since one of the requirements for the manufacturer is to inspect units within a model line to determine conformance with the tolerances and design aspects of the original unit, the manufacturer may elect to store the original unit or maintain adequate drawings with specifications to comply with this requirement. If more than 20% of the units do not conform with the original model tested, than the nonconforming unit(s) must be tested and certified in order to be sold

in the Commonwealth of Massachusetts. If an owner has a problem with a model, then the owner needs to contact the manufacturer of the unit and seek assistance from the manufacturer to rectify the problem.

Comment- Use of wood and the systematic management of cutting down of trees for wood fuel is a useful component for sustainable forestry.

Response- MassDEP agrees.

Comment- Information on how to operate and burn wood correctly should be provided.

Response- MassDEP agrees and the regulations include a requirement that sellers of OHHs provide buyers with the owner's manual, including operating and maintenance instructions. There are also many sources of information, including EPA's Best Burn practices at the following link: http://www.epa.gov/woodheaters/bestpractices.htm.

APPENDIX 1

List of People Who Submitted Written and/or Oral Comment on the Public Hearing Draft of the Outdoor Hydronic Heater Regulations

AFRESON	GERALDINE	
ALLEN	NANCY	BOH, SHREWSBURY
AMERICA LUNG ASSOC		
ANDRUS	DAN	
ASCIONE	ARLENE	
AVALORE	JAMES	
AYERS	GLEN	
BAKER	JEFFREY	
BAKER	THOMAS	
BARRY	PATRICIA	
BEAGIN	MARY ANN & GARY	WEST SUDBURY NEIGHBORHOOD GROUP
BERBERINI	MIKE	
BERGSTEIN	NANCY	
BOULIN	AMY	
CONDON	SUZANNE	MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
BRIAN	DAVID	
BRIAN	VICTOR	
BROWN SC.D	DAVID	
BURROUGHS	DAVID	
CAPISTON	ANDREW & LINDA	
CARCHEDI	JOHN	
CARON	CHARLES	
CARPENTER	J	
CHAPEL	HAL	
CLARK	CHUCK	
CLARK	STEPHEN	
CLEMENS III	ALBERT	
CLOUSER	AARON	
CODOGAN	DEBBIE	
COLLINS	JERRY	
CONKEY	JAMES	
CONKEY	SANDRA & JOHN	
CONLON	BRIAN	
CORTOIS	BERNARD	
CROUSE	JOYCE	
D'AMICO	STEPHEN	
DAYLE	VALERIE	HEALTH AGENT, TOWN OF PHILLIPSTON
DOLAN	ELLEN	
DONLON	ANDREA	
DRUTE	BOBBIE & JOHN	
EDWARD GEORGE & ASSOC		REPRESENTING CRYSTAL ROCK FARM, INC.

ELATRAL		
EMERSON	JAMIE	
EMOND	ERIC	
EWEIN	E	
FISKE CO INC	LEON	
FLICKER	KEVIN	
FORGUES	MARY ANN	
FRANK	OSCAR	
FROST	DARLEEN	
GARBARE	KALENE	HEALTH AGENT, NABH
GARY	ED	
GAUCHER	R	
GAUTHIER	MICHAEL	
GILBERT	STEPHEN	
GLAN	JELIDIN	
GLAN	ROBERTA	
GLICK	BENJAMIN	
GOFF	CRAIG	
GOLDMAN	BARBARA	
GOODMAN	ELLEN & JIM	
GOREWITZ	ERIC & JEN	
GOSWAMI	SUSAN & BOBBY	
GRAF	MICHAEL	HEALTH AGENT, BELLINGHAM
GRAY	SAL	
GROTON BOARD OF HEALTH		
GROWE	JOYCE	
GULDBERG	PETER	
HAAS	JULIETTE	
HAAS	TOM	
HABERLIN	DON & BARBARA	
HAMEL	PAULA	
HANBEY	DANIELLE	
HANKEY	JOHN	
HANNIGAN	TIM	
HANSON	ALAN	
HAYWOOD	JAMES	
HENDERSEN	WENDY	
HICKEY	MAY	
HJERPE	KAROL & ERIC	
HUGABONE	AL	
HUTCHESEE	BOB	
IZZO	LEONARD	AGENT, BOH HOPEDALE, MENDON, MILFORD
JEKOT	CHET	
KARMANIAM FAMILY		
KING	JAMES	
KNIPE	SANDRA	BOARD OF HEALTH, HUBBARDSTON
KOZIARA	WILLIAM	
LARKIN	JAMES	
LAVELLETE	GARY	

LEHMAN	MARTY	
LESSIER	JOAN	
LESSIER	PAUL	
LEUPOLD	ROBERT	
LEVINE	ALICE	
LEVINE	KENNETH	
LORION	JOSEPH	
LUNIEWICZ	LOIS	AGENT, GRAFTON BOARD OF HEALTH
MA FOREST LANDOWNERS ASSOC		
MAASHANT	GERDA	
MACEWEN	BRIAN	
MACEWEN	ROBERT	
MACGREGOR	ANN	
MALLET	ROGER	AGENT, ORANGE
MANLINDALY	DONKHY	
MARA	JOSEPH	
MARGEATTE	BEN	
MARGEATTE	JOE	
MAWN	JUNE	
MAXY	BRUCE	
MCDONALD	BOB	
MCLEAN	RUSSELL & VIVIAN	
MCNULTY	PAUL	BOARD OF HEALTH, WESTBOROUGH
MONTIVERDI	CHRISTOPHER	BOARD OF HEALTH, LEICESTER
MORIN	LISA	
NASH	DAWN	
NICOL	DAWN	
NICOLL	DANA	
NIELBLING	CHARLES	NEW ENGLAND WOOD PELLET
NIZTILE	PAULINA	
O'CONNELL	KIMMEL	
O'CONNOR	DARLENE	HEALTH DIR., TOWN OF LEICESTER
OLSEN	RICHARD	
OLSON	ROBERT	
ONAATO	PAULITTE	
ONARATO	JOSEPH	
O'REILLY	ED	
ORLANDER	JOHN	
O'ROURKE	THOMAS	
ORPHAN	WILLIAM	
PALMER	ROGER	
PATENAUDE	CHUCK	
PAUL LUSSIER CONSTRUCTION		
PIAZZA	STEVE	
PLACE	DAVE& DEB	
PLUMER JR	ROBERT	
POKARA	ANN	
PURCELL	THOMAS	HEALTH DIRECTOR, WEBSTER/DUDLEY
RAVUNSKI	CHERYL	BOARD OF HEALTH, SUTTON

REED	MARK	
REED	DOUGLAS	
REED	SHELLEY	
REED	TARA	
REINSTEIN	MARCIA	
RESOR	SENATOR PAMELA	
REUTTINGER	EILEEN	
REZZA	JOSEPH	
ROHOZ	BARBARA	
ROONEY	JAMES	
RUSIECKI	ALYSSA	BOARD OF HEALTH, STURBRIDGE
SALTIN	COREY	
SAMUELSON	DANA	
SCCAFAPOLOS	FIFI	
SCHATZ	ERIC	
SCHLACKMAN	MARC	
SCOUFEPOULOS	FIFI	
SILVERMAN	ALBERT	
SILVERMAN	DONNA	
SIMMONDS	BRIAN	
SINCLAIR	JANET	
SINDAIN	JANET	
SMITH	ELIZABETH	
SONIA	JOHN	
ST GERMAINE		
STETSON	CHARLES	
SWEDBERG	ELIZABETH	
T	RICHARD	
TEMPLETON BOARD OF HEALTH		
TERRY	JAMIE	HEALTH AGENT, NORTHBOROUGH
TEXSARABIA	MARCELINO	
UREVICH	AMY	BOARD OF HEALTH, AUBURN
US EPA		
VENTURA II	ALFRED	
VIELQAS	ALERE	
WEST	LISA	
WHITEHEAD	RICHARD	
WHITEMAN, OSTERMAN & HANNA,		REPRESENTING CENTRAL BOILER, INC.
WILLIS	ALAN	
WILUSZ	JAMES	
WROBEL	PAUL	