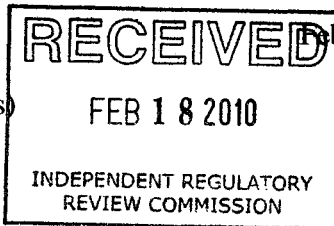


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Group Against Smog and Pollution Inc.
Wightman School Community Bldg.
5604 Solway Street, Room 204, Pittsburgh, PA 15217
(Tel) 412-325-7382 (Fax) 412-325-7390
www.gasp-pgh.org email:gasp@gasp-pgh.org



February 12, 2010

VIA EMAIL PDF (RegComments@state.pa.us)

Environmental Quality Board
P.O. Box 8477
Harrisburg, PA 17105-8477

RE: Proposed rulemaking for 25 PA code Chapters 121 and 123 Regarding Provisions for the Control of Emissions of Particulate Matter from the operation of Outdoor Wood-Fired Boilers

Dear Environmental Quality Board:

Please accept these comments on behalf of the Group Against Smog and Pollution (GASP) regarding the proposed revisions to Chapters 121 and 123 of Title 25 of the Pennsylvania Code to control particulate matter emissions from outdoor wood-fired boilers.

As the price of home heating oil, natural gas, and liquefied petroleum gas (LPG) rises, many households are looking for heating alternatives. For this reason outdoor wood-fired boilers (OWBs) are increasing in popularity. Unfortunately, they are a significant and growing source of PM2.5 emissions in Pennsylvania.

The proposed regulations are a welcome initial step to mitigate the harm to human health and the environment posed by OWBs and other wood-burning appliances. However even the most carefully crafted regulations will remain insufficient to prevent all OWB-related nuisance violations, and as the use of OWBs and other wood-burning appliances increases, additional measures may be necessary to address the regional impact of PM and hazardous air pollutants (HAPs) resulting from wood combustion.

Therefore GASP supports the adoption of OWB regulations and we offer recommendations to strengthen them; however we offer our support with the caveat that these regulations are at best a preliminary step in addressing the hazards posed by widespread wood combustion. We suggest that PADEP explore options to supplement these regulations, such as an educational campaign outlining the hazards of wood smoke and offering advice on how to burn cleanly, and by offering support for municipal efforts to adopt more stringent OWB regulations.

In addition, because OWB-related nuisance violations are inevitable, PA DEP must be vigilant in enforcing opacity and odor regulations in order to safeguard all Pennsylvania residents.

1. Particulate Matter Emissions Rates from Wood Combustion are Far Greater than Emissions From Natural Gas or Fuel Oil Furnaces

While wood smoke may seem benign compared to air pollution created by vehicles and large stationary sources of pollution, it is quite toxic. Wood smoke is made up of a complex mixture of gases and fine particles produced when wood and other organic matter burn. Carbon monoxide, nitrogen oxides, sulfur oxides and hazardous air pollutants such as, benzene, dioxin, phenols, aldehydes, and polycyclic aromatic hydrocarbons (PAHs), are also released when wood is burned.

The Connecticut Department of Environmental Protection completed a comparison of homes heated with natural gas, oil, and OWBs, and concluded that emissions from one OWB are equivalent to emissions from four non-certified wood stoves, 18 certified wood stoves, 205 oil furnaces or 3,000 to 8,000 natural gas furnaces.¹ While we support the Department's requirement that new OWBs meet the EPA's Phase 2 emissions standard of 0.32 lb/MMBtu heat output, even the new cleaner-burning Phase 2 boilers will still exceed the emissions of 40 residential natural gas furnaces on a lb/MMBtu basis.²

In addition to adopting a limit expressed in pounds of emissions per million BTUs of heat output, GASP proposes as the Vermont Agency of Natural Resources did, to adopt companion limits of 18 grams per hour for residential size units and 20 grams per hour for commercial size units. The purpose of these companion limits is to prevent the certification of OWB models that create excessive smoke and particle emissions under one operating condition, but not under others.³

Fine particle exposure is associated with asthma, respiratory infections, reduced lung function, cancer, heart attack, stroke, and premature death. Children, the elderly, and those with cardiovascular or respiratory disease are especially at risk.

¹ CTDEP. Connecticut Department of Environmental Protection. Connecticut DEP Fact Sheet: Outdoor Wood Burning Furnaces. State of Connecticut, Connecticut Department of Environmental Protection. July 2004, revised 2005; available at: http://www.ct.gov/dep/lib/dep/air/wood_stove_furnaces/owf.pdf.

² EPA Emission Factors AP-42, Fifth Edition, Volume I, Chapter 1, section 1.4, Table 1.4-2, p. 1.4-6, available at: <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf>.

³ Proposal For a "Phase II" Particulate Matter Emission Standard and Related Provisions for Outdoor Wood-Fired Boilers, Field Services Section, Air Pollution Control Division, Feb. 27, 2009, p. 9, available at: http://www.anr.state.vt.us/air/docs/SIS_AttB_Standard_Proposal_Ph2.pdf

Ninety percent of wood smoke is in the most harmful particle size range, averaging less than 1 micron⁴ – so small that closed doors and windows cannot stop it from entering, even in newer, energy-efficient, weather-tight homes.⁵

These toxic, ultra-fine particles, can penetrate more deeply into the lungs, enter the bloodstream, and even pass through cell membranes.⁶ The EPA estimates that the lifetime cancer risk from wood stove smoke is twelve times greater than that from an equal volume of second hand tobacco smoke.⁷ The EPA also concluded that, “burning two cords of wood produces the same amount of mutagenic particles as: Driving 13 gasoline powered cars 10,000 miles each at 20 miles/gallon.”⁸

2. OWB Emissions are Greater on a grams/hr basis than Emissions from Other Wood Burning Appliances

The typical cumulative stack emissions from OWBs are significantly higher than other EPA-certified wood burning appliances and, unlike wood and pellet stoves, are currently unregulated.⁹ There are several reasons for this, primarily related to the basic design of OWBs. When an operator dampers down the unit, the lack of oxygen to support combustion creates a build up of materials such as creosote. When opening the damper, these materials burn and release immediately to the air. Excessive loading and/or low demand for heat further aggravates this problem. In addition, OWBs emit more pronounced smoke than woodstoves due to the short stack height, which does not disperse smoke above living spaces in neighboring homes.¹⁰

3. OWB Emissions May Interfere with the Commonwealth’s Ability to Meet the National Ambient Air Quality Standards (NAAQS) for PM2.5

⁴ National Safety Council (n.d.). Wood smoke: One of America’s largest sources of pollution that is responsible for 20,000 deaths each year. Retrieved March 25, 2007, from <http://burningissues.org/car-www/pdfs/WoodSmBroharris.pdf>. -- Dasch, J.M., Particulate and Gaseous Emissions from Wood-Burning Fireplaces. *Environmental Science and Technology*, 1982. 16(10): p. 639-645

⁵ Larson, T.V. and J.Q. Koenig, A Summary of the Emissions Characterization and the Noncancer Respiratory Effects of Wood Smoke; 1993: p. 46.

⁶ *Health Aspects of Air Pollution with Particulate Matter, Ozone and Nitrogen Dioxide*, WHO WORKING GROUP, Jan. 2003, at 21 (available at <http://www.euro.who.int/document/e79097.pdf>); Li, et al, *Ultrafine Particulate Pollutants Induce Oxidative Stress and Mitochondrial Damage*, 111 ENVIRONMENTAL HEALTH PERSPECTIVES 455 (2003); Pope et al. *Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution*, 287 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION 1132 (2002).

⁷ The Health Effects of Wood Smoke, Washington State Department of Ecology, p. 15 available at: <http://www.ecy.wa.gov/pubs/92046.pdf>

⁸ Dr. Joellen Lewtas, Contribution of Source Emissions of the Mutagenicity of Ambient Urban Air Particles, U.S. EPA, #91-131.6, 1991

⁹ NESCAUM, Outdoor Wood Boiler Factsheet, p.1, available at: www.nescaum.org/documents/owbfactsheetfinal.pdf

¹⁰ NESCAUM Assessment of Outdoor Wood-fired Boilers, p. 2-1, available at: http://www.nescaum.org/documents/assessment-of-outdoor-wood-fired-boilers/2006-1031-owb-report_revised-june2006-appendix.pdf (hereinafter “NESCAUM Assessment”).

When a significant number of units are installed they can constitute a significant source of PM_{2.5}, something many parts of Pennsylvania cannot afford, particularly the commonwealth's PM_{2.5} non-attainment areas. In October of 2006, the EPA revised the primary and secondary 24-hour NAAQS for PM_{2.5} from 65 µg/m³ to 35 µg/m³.¹¹ In December 2008, all or portions of the following counties in southwestern PA were designated in non-attainment for the 2006 24-hour fine particulate NAAQS: Allegheny, Armstrong (partial), Beaver, Butler, Greene (partial), Indiana (partial), Washington, and Westmoreland.¹² In order for these counties to attain the new more stringent 24-hour NAAQS for PM_{2.5} the commonwealth must reduce emissions from OWBs, as well as other sources of PM_{2.5}. Data collected in 2006 revealed that the estimated number of OWBs sold in Pennsylvania since 1990 was 11,836 units.¹³ While we support the Department's requirement that new OWB installations must meet the EPA's Phase 2 emissions standard, the proposed regulation will do very little to control the emissions from the estimated 12,000 existing units that are pre-Phase 2, and, as discussed above, even phase 2 boilers produce significantly greater emissions than natural gas furnaces.

4. Projected OWB Emission Rates do not Account for the Common Practice of Burning Prohibited Fuels. The Department must Vigorously Enforce the OWB Regulation's Fuel Prohibitions

Unfortunately, not all OWB owners are responsible users. State agencies have documented the burning of wet, large, unsplit wood; wood waste; yard waste; refuse; tires; and railroad ties.¹⁴ In fact some manufacturer's websites state the ability to burn green or scrap wood as one of the benefits of OWBs. For example, the Pacific Western website states that their unit, "easily burns junk wood including pallets."¹⁵ The use of OWBs for trash burning increases potential emission and public health problems related to these devices.¹⁶

Burning prohibited fuels results in greater PM emissions.¹⁷ More troubling, it also results in the production of significant quantities of dioxins.¹⁸ Dioxins and "dioxin like" compounds are a group of 30 highly toxic chlorinated organic chemicals. Currently, the largest quantified source of dioxin emissions is the uncontrolled burning of household trash (backyard burning).¹⁹ Studies have shown that only small amounts of chlorinated materials in waste are required to support dioxin formation when burning waste. This means that even when materials containing high levels of chlorine, such as PVC, are

¹¹ 71 FR 61143.

¹² 74 FR 58687.

¹³ NESCAUM Assessment, *supra* note 10, Appendix C: Estimated National Sales of OWBs, p.C-2.

¹⁴ *Id.* p. 2-2.

¹⁵ *Id.* p. 2-3.

¹⁶ *Id.* p. 4-4.

¹⁷ *Id.* p. 2-3.

¹⁸ USEPA – Backyard Burning – Human Health

<http://www.epa.gov/waste/nonhaz/municipal/backyard/health.htm>

¹⁹ *Id.*

removed from household trash, burning the waste still creates dioxins because nearly all household waste contains trace amounts of chlorine. In contrast to municipal combustors, which operate under highly controlled conditions designed to reduce formation and emission of air pollutants, backyard trash burning is uncontrolled.²⁰ The low temperature burning and smoldering conditions typical of backyard trash fires promote the formation of air pollutants including polychlorinated dibenzodioxins and dibenzofurans, fine particulate matter and PAHs.²¹

The sizeable firebox capacity and large loading door dimensions characteristic of OWBs facilitate the loading and combustion of non-wood materials, such as household waste (e.g., paper, plastic, and packaging). The combustion of these materials in devices that have low stacks, lack emissions control systems, and operate under low temperature conditions creates the potential for generating hazardous air pollutants in close proximity to homes, schools, businesses and other areas where people spend significant amounts of time.²²

Thus the promulgation of this regulation must be accompanied by a vigilant enforcement effort to ensure prohibited materials are not burned. We also suggest the Department alter the “clean wood” definition in 25 Pa. Code § 121.1 to read:

Clean dry wood – wood that:

- (i) contains no paint, stains or other types of coatings;
- (ii) has not been treated with preservatives, including but not limited to copper chromium arsenate, creosote, pentachlorophenol or the like; and;
- (iii) does not have a moisture content in excess of 20%.

5. The OWB Regulations Must Require a Greater Setback Distance

The following states, counties, and municipalities have adopted a minimum 200 foot setback for Phase 2 boilers:

State of Connecticut²³
State of New York²⁴
Suffolk County, NY²⁵
City of Binghamton, NY²⁶
Village of Owego, NY²⁷

²⁰ Dioxinfacts.org -- http://www.dioxinfacts.org/sources_trends/trash_burning.html

²¹ *Id.*

²² *Id.*

²³ Connecticut Public Act 05-227, p.1, *available at*:

<http://www.anr.state.vt.us/dec/air/owb/pdf/CTLaw05.pdf>

²⁴ New York OWB Bill -A10693, p.2, *available at*: <http://www.anr.state.vt.us/dec/air/owb/pdf/NYOWB-A10693.pdf>

²⁵ New York Municipalities with Requirements Pertaining to OWBs As of December, 2007, p. 3, *available at*: http://www.anr.state.vt.us/dec/air/owb/pdf/NY_Municipal_Ord_07.pdf

²⁶ *Id.* p. 4.

²⁷ *Id.* p. 9.

Town of Warwick, NY²⁸
State of Vermont²⁹

At a minimum, PA DEP should increase the minimum setback distance for Phase 2 boilers in the proposed regulations to 200 feet. Given what we know about the challenges to pollution dispersion Pennsylvania's complex topography and frequent inversions pose, GASP believes a setback requirement greater than 200 feet is necessary. Several states have created model ordinances that localities may adopt that recommend choosing a minimum distance of 300 or 500 feet.³⁰

6. The OWB Regulations Must Require a Greater Minimum Stack Height

In some cases, increased stack heights will not be sufficient to prevent OWB-related nuisances or exceedances of ambient air quality standards. Emissions may not have adequate velocity to rise and disperse. Stack heights 8-12 feet above the ground typically fail to disperse smoke adequately, resulting in excessive ground-level smoke.³¹ Certain weather conditions aggravate this situation, such as cold weather inversions.³²

While stack height increases alone will not always provide sufficient protection, we support minimum stack height requirements. For Phase 2 OWBs stack heights should extend a minimum of 10 feet above the ground and at least five feet above the highest peak of the highest residence located within 200 ft. of the OWB.

7. The Regulations Must Include More Stringent Standards for Commercial Boilers

The Department should make a distinction between residential and commercial size boilers in the regulation. Commercial size boilers are a heater with a rated thermal output greater than 350,000 Btu/hr. Naturally, this greater thermal output correlates with greater total emissions, and entities with the need for such a boiler and the financial resources necessary to install and operate such a boiler can better bear any financial burden more stringent regulations for these larger boilers may entail.

²⁸ New York Municipalities with Requirements Pertaining to OWBs As of December, 2007, p. 10, available at: http://www.anr.state.vt.us/dec/air/owb/pdf/NY_Municipal_Ord_07.pdf

²⁹ Outdoor Wood-Fired Boilers: An Informational Fact Sheet from the Vermont Department of Environmental Conservation, p. 3, available at: www.vtwoodsmoke.org/pdf/OWBFact-1g2.pdf

³⁰ Michigan Department of Environmental Quality, Clean Air Assistance Program, Model Ordinance for Outdoor and Open Burning, A Guide for Michigan Counties, Cities, Villages, and Townships, p 5, available at: www.deq.state.mi.us/documents/deq-ess-caap-modelordinance.pdf; Wisconsin Department of Natural Resources, Model Ordinance for Outdoor Burning, Open Burning and Burning Refuse: A Guide for Wisconsin Counties, Cities, Villages and Towns, p. 7, available at: <http://dnr.wi.gov/environmentprotect/ob/modelOrdinance.htm>

³¹ NESCAUM Assessment *supra* note 10 at p. 2-1.

³² *Id.*

In Massachusetts large commercial boilers are subject to more stringent setback requirements than residential boilers.³³ Likewise, PA DEP should establish a larger setback for commercial boilers as well as a greater minimum stack height.

8. Existing, Non-Phase II OWBs should be phased out if they can not meet more stringent set backs and stack height requirements

Air pollution dispersion modeling by Vermont and New York State indicate that particulate emissions from OWBs that comply with Vermont's current Phase I emission limit (0.44 lb/MMBtu of heat input) may cause significant air quality impacts at distances that could easily adversely affect adjoining or nearby properties, especially when multiple units are located in the same neighborhood.³⁴ In several scenarios, the Phase I modeling showed impacts above 35 µg/m³ (the federal 24 hour NAAQS) beyond 200 feet.³⁵

At a minimum, GASP believes all existing pre Phase 2 OWBs should require a 500ft. setback and a stack height at least 5 feet greater than the height of the highest structure within 500 feet. If insufficient property exists to meet the setback requirement the OWB must be removed or made inoperable 2 years from the date that this regulation is enacted. The regulation should include a provision allowing PA DEP to waive this setback requirement if a property is bounded by extensive unoccupied properties on which no residence is permitted to be placed.

The Department should consider including limited exemptions for those residents who use OWBs as their only source of heat. Suggested language:

Limited Exemption, Only Source of Space Heat: The requirement of this regulation shall not apply to any person whose only source of heat for residential space heating is a wood-burning device. A person claiming this exemption cannot have use of another form of functioning space heating.³⁶

9. OWB Use Should be Prohibited Between May 1st and September 30th

GASP supports the Department's suggested seasonal restrictions on OWB use between the dates of May 1st and September 30th. During these months of relative warmth, OWB operation is not necessary for the purposes of home heating, and the frequency and severity of nearby residents' exposure to OWB emissions is potentially greater because

³³ Massachusetts, 310 CMR 7.26(50) Outdoor Hydronic Heaters, p. 3, *available at*: <http://www.mass.gov/dep/service/regulations/ohhregfl.pdf>

³⁴ Proposal for a "Phase II" Particulate Matter Emission Standard and Related Provisions for Outdoor Wood-Fired Boilers, Field Services Section Air Pollution Control Division, Feb. 27, 2009, p.8, *available at*: http://www.anr.state.vt.us/air/docs/SIS_AttB_Standard_Proposal_Ph2.pdf

³⁵ *Id.*

³⁶ Bay Area Air Quality Management District, Regulation 6 Particulate Matter And Visible Emissions, Rule 3, Wood-Burning Devices, Index, p. 6-3-3, *available at*: <http://www.baaqmd.gov/~media/Files/Compliance%20and%20Enforcement/rg0603.ashx>

individuals are more likely to open windows, spend more time outdoors, or engage in strenuous exercise during the warm weather.

10. The OWB Regulations Should Explicitly Reserve the Right For Localities to Adopt More Stringent OWB Regulations

The Department should include an explicit statement in the regulations reserving the right for PA municipalities to pass more stringent OWB ordinances to prevent and remove nuisances and protect public health.

11. The OWB Regulations Should Explicitly Reserve the Right of Individuals to Seek Common Law Remedies for Harms Associated with Use of OWBs.

The Department should include an explicit statement in the regulations reserving the right for individuals adversely affected by the operation of an OWB to seek common law remedies such as nuisance or trespass for harms resulting from the operation of OWBs.

12. PA DEP Should Develop a Financial Assistance Program for Individuals for whom Compliance with the OWB Regulations Would pose a Significant Financial Burden

We recognize that the PA DEP is trying to control PM2.5 emissions from outdoor wood-fired boilers by promulgating this regulation, but we believe that they do not go far enough to protect all residents. We also acknowledge that a complete ban could create a financial hardship for some PA residents who use OWBs as their sole source of heat. For this reason we support the establishment of a program to provide financial assistance to individuals for whom compliance with the OWB regulations poses a significant financial hardship. Financial assistance should be solely to cover the costs of replacing a noncomplying OWB with a cleaner, non-wood burning heating technology.

We appreciate the opportunity to make comments.

Sincerely,

/s/

Rachel Filippini
Executive Director

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RECEIVED

From: Joe Osborne [joe@gasp-pgh.org]
Sent: Friday, February 12, 2010 11:47 PM
To: EP, RegComments
Cc: gasp@gasp-pgh.org
Subject: GASP Comments - Outdoor Wood Boilers
Attachments: GASP - OWB comments.pdf

FEB 18 2010

INDEPENDENT REGULATORY
REVIEW COMMISSION

Please find attached the comments of the Group Against Smog and Pollution, Inc. regarding the proposed rulemaking to regulate outdoor wood-fired boilers.

If you have any questions or require any additional information please do not hesitate to get in touch.

Sincerely,
Joe Osborne

--
Joe Osborne
Legal Director
Group Against Smog and Pollution, Inc.
5604 Solway Street, Suite 204
Pittsburgh, PA 15217
Phone: (412) 325-7382
Fax: (412) 325-7390
Cell: (617) 909-8365
<http://www.gasp-pgh.org/>