
Outdoor Wood-Fired Boilers and 25 *Pa. Code* Section 123.14

Pennsylvania Planning Association
Harrisburg, PA
September 2, 2010

Jane Greber
Air Quality Program Specialist
Bureau of Air Quality
Department of Environmental Protection

Outdoor Wood-Fired Boilers

- **What are outdoor wood-fired boilers (OWBs)?**
 - **What are the health impacts and other concerns regarding OWBs?**
 - **What are the provisions of the final rulemaking?**
 - **What are the alternatives for local municipalities?**
-

What are Outdoor Wood-Fired Boilers?

- OWBs are free-standing fuel-burning devices that resemble a small shed or mini-barn with a short smokestack on top.
 - They are used to heat homes and buildings, produce domestic hot water, heat swimming pools or hot tubs, and provide heat to agricultural operations such as greenhouses and dairies.
 - OWBs have many other names, such as:
 - outdoor wood-fired furnaces
 - outdoor wood-burning appliances
 - outdoor hydronic heaters
-

Definition of Residential Outdoor Wood-Fired Boilers

- An OWB is a fuel-burning device that is:
 - Designed to burn, or capable of burning, clean wood or other approved solid fuels;
 - Designed specifically for outdoor installation or installation in structures not normally intended for habitation by humans or domestic animals, including garages or sheds);
 - Designed to heat building space and/or water through distribution, typically through pipes, of a fluid heated in the device, typically water or a water/antifreeze mixture.
 - Has a rated thermal output of less than 350,000 BTU per hour.
-

Why Use OWBs?

- Possible lower fuel costs
 - Own woodlot
 - Cut own wood
 - Wood gatherers
 - Plentiful supply of wood – in some areas of PA oil and gas are difficult to obtain
 - Renewable source of fuel
 - Provides a constant heat
 - Outside location
 - Woodsman ethic
-

Why was the Outdoor Wood-Fired Boiler Rulemaking Initiated?

- The Department receives numerous citizen complaints related to health concerns, odors, burning inappropriate fuels and smoke.
 - Complaints have been received from 53 of the 67 counties within the Commonwealth.
 - Smallest conventional OWBs emit ~ 1 ton particulate matter (PM) annually (mostly PM_{2.5}). Emissions from a single conventional OWB are equivalent to emissions from approximately 205 oil furnaces and 8,000 natural gas furnaces.
-

Pollutants of Concern

Fine Particulate Matter

- PM2.5 can penetrate the deepest part of the lungs and may even get into the bloodstream.
 - Health concerns: irritation of the airways, coughing; difficulty breathing; decreased lung function; asthma attacks; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease.
 - Susceptible populations to PM2.5 exposure: people with asthma, diabetes, and heart and lung disease; all older adults; and all children under 4 years old. This accounts for approximately 50% of the American population.
-

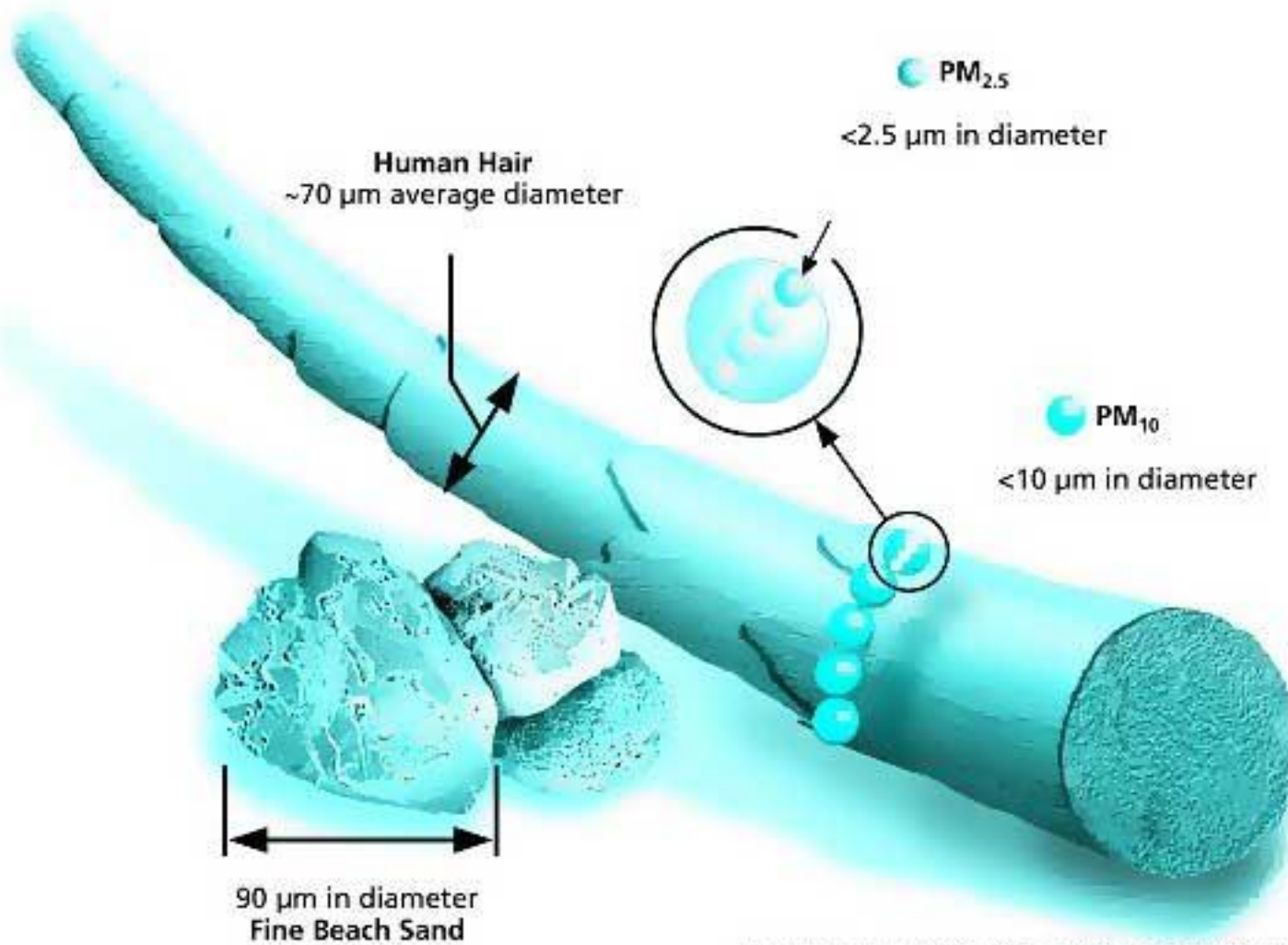


Image courtesy of EPA, Office of Research and Development

Additional Health Concerns

Hazardous Air Pollutants

- Wood smoke also emits carbon dioxide, hydrogen chloride, hydrogen cyanide, benzene, styrene, formaldehyde, arsenic, lead, chromium, dioxins, furans, PCBs, polycyclic aromatic hydrocarbons (PAHs).
 - Because of the large firebox and outdoor location of OWBs, some owners burn garbage, hazardous waste, tires, and other items that produce other toxic and hazardous air pollutants.
-

Additional Health Concerns

- Emissions from OWBs are exacerbated by:
 - ❑ No emission control systems
 - ❑ Incomplete combustion from low temperature conditions
 - ❑ Short chimneys
 - ❑ Potential year round use – Indoor vs Outdoor concentrations
 - ❑ Topography
 - ❑ Multiple OWBs in an area
-

Federal and State Outdoor Wood-Fired Boiler Initiatives

- The EPA and some OWB manufacturers developed a voluntary program to promote the manufacture and sale of cleaner-burning OWBs.
 - OWBs that meet the Phase 2 emission standard of 0.32 lbs PM/MMBtu heat output and are at least 90% cleaner burning than conventional models qualify for the voluntary program .
 - To date, the EPA has qualified 15 Phase 2 OWB models made by nine manufacturers.
 - Eight Mid-Atlantic and New England states have enacted OWB legislation or proposed regulations that establish Phase 2 particulate matter standards for new OWBs.
-

Environmental Quality Board Public Participation Process

- September 15, 2009 – The Board approved the proposed OWB rulemaking.
 - October 17, 2009 – Published notice of the proposed rulemaking at 39 Pa. B. 6068; the 119-day comment period closed on February 12, 2010.
 - Public hearings on the proposed rulemaking were held in five locations:
 - Harrisburg – November 30, 2009
 - Wilkes-Barre – December 1, 2009
 - Cranberry Township – December 2, 2009
 - Williamsport – December 3, 2009
 - Coudersport – January 13, 2010
 - July 15, 2010 – The Board approved the final-form OWB regulation
-

Environmental Quality Board Public Participation Process

- Substantial public interest in the proposed rulemaking
 - Comments received from ~ 2,000 commentators. Most comments fell into one of three categories:
 - ❑ Full support (538)
 - ❑ Support a state regulation contingent with revisions being made to the proposed regulation (723)
 - ❑ Opposed (745)
-

Final-Form Rulemaking

Outdoor Wood-Fired Boilers

- Definitions - added two additional definitions: “New Phase 2 OWBs” and “Non-Phase 2 OWBs” and clarifies the definition of OWB to exclude boilers equal to or greater than 350,000 BTU/HR, which are considered commercial units.
 - Adds a sell-through provision for non-Phase 2 OWBs through May 31, 2011.
 - The non-Phase 2 OWBs must be installed a minimum of 150 feet from the nearest property line.
 - A permanently attached stack must extend a minimum of 10 feet above the ground and be installed according to the manufacturer’s specifications.
 - Adds an exemption for OWBs transferred as part of a real estate transaction.
-

Final-Form Rulemaking

Outdoor Wood-Fired Boilers

- Emission standards – New OWBs must be Phase 2 qualified by EPA
 - Setback requirements for new Phase 2 OWBs – 50 ft from the property line instead of 150 feet
 - Stack height requirements for new Phase 2 OWBs - the permanently attached stack must extend a minimum of 10 feet above the ground and be installed according to the manufacturer's specifications.
-

Final-Form Rulemaking

Outdoor Wood-Fired Boilers

- No stack height requirements for existing OWBs.
 - Fuel requirements for all OWBs operating in this Commonwealth -
 - Clean wood
 - Clean wood pellets
 - Home heating oil, natural gas or propane that
 - Complies with all applicable sulfur limits
 - Is used as a starter or supplemental fuel for dual-fired OWBs
 - Other fuel approved in writing by the Department
-

Final-Form Rulemaking – Outdoor Wood-Fired Boilers

Costs to the regulated community:

- Manufacturers – One time cost for:
 - Research and development
 - Testing and certification for each new model (~\$30,000 + shipping)
 - Qualifying units will be certified by EPA and labeled accordingly.
- There are three PA manufacturers:
 - Mahoning Outdoor Furnaces is field testing a Phase 2 model.
 - Freedom Outdoor Furnaces and Corle Building Systems believe their models meet the Phase 2 standards, but have not tested them.
- Purchasers – Phase 2 OWBs are approximately 15% more costly. These costs are offset by being much more efficient:
 - Older models cost between \$8,000 - \$18,000
 - Cleaner-burning models cost between \$9,200 - \$20,700

Impacts - Final-Form Rulemaking Outdoor Wood-Fired Boilers

- When compared with a conventional model, PM2.5 emissions will be reduced by 90% for every Phase 2 OWB that is installed after the effective date of this rulemaking.
 - The operation and environmental impact of existing OWBs will also be improved by the use of allowed fuels.
 - The final rulemaking will be submitted to the EPA for approval as a revision to the State Implementation Plan.
-

What's Next?

- The final-form OWB regulation will become effective upon publication of the final rulemaking in the *Pennsylvania Bulletin*.
 - Section 12 of the Air Pollution Control Act (APCA) authorizes local municipalities to enact more stringent ordinances. The owners of new and existing units would need to comply with the DEP OWB regulation and may be subject to more stringent local ordinances.
 - Pursuant to Section 4.1 of the APCA, the OWB final rulemaking would not apply to OWBs being used for the “production of agricultural commodities.” However, farm operations could be subject to ordinances that would be enforced by local jurisdictions.
-



Questions?

Contact: Jane Greber
717-772-2328
jgreber@state.pa.us
