

**ALASKA COMMUNITY ACTION ON TOXICS— CITIZENS FOR CLEAN AIR—  
NORTHERN ALASKA ENVIRONMENTAL CENTER—SIERRA CLUB**

January 24, 2014

VIA ELECTRONIC MAIL TO scott.sloane@alaska.gov

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**Re: Proposed Changes to Alaska Department of Environmental Conservation  
Regulations; Air Quality Fine Particulate Matter Regulations**

Dear Mr. Sloane:

Thank you for the opportunity to offer comments on the Alaska Department of Environmental Conservation's (ADEC) proposed regulations to address fine particulate matter (PM-2.5). Please accept these comments filed on behalf of Alaska Community Action on Toxics, Citizens for Clean Air, Northern Alaska Environmental Center, and Sierra Club ("Commenters" or "we").

We appreciate that ADEC finally has begun to develop the long overdue measures necessary both to address dangerous PM-2.5 pollution levels in the Fairbanks North State Borough ("Fairbanks," "Borough," or FNSB) and to meet the requirements of the Clean Air Act (CAA). Current wintertime PM-2.5 levels in Fairbanks exact a huge toll on the health and welfare of Fairbanks community members—especially children, the elderly, and chronically ill people—necessitating the prompt adoption and implementation of pollution prevention and control measures.

As discussed in more detail below, we support common sense measures proposed by ADEC to address wood smoke: outdoor open burning should be restricted in wintertime; only the fuel(s) for which a given heating device was designed should be burned in that device; and new stoves sold or installed in Fairbanks should meet the proposed lower emissions standard. ADEC's peer-reviewed analysis confirms that clean-burning heating devices are readily available in Fairbanks and they are no more expensive than dirtier models.<sup>1</sup> Indeed, efficient devices actually save their owners money over time with lower fuel use.<sup>2</sup>

Unfortunately, the measures proposed by ADEC do not go far enough to provide relief from the unhealthy wintertime air quality that plagues the Borough. Under the CAA, ADEC must reduce PM-2.5 emissions from the many sources in Fairbanks enough to comply with the 2006 24-hour

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<sup>1</sup> Steve Colt, Ph.D., Peer Review Comments On The Need and Basis for More Stringent Wood-fired Heating Device Emission Standards (Dec. 13, 2013), at 2-4.

<sup>2</sup> J. Reeb, Oregon State University Extension Service, Home Heating Fuels (June 2009), Ex. 1 at 2-3.

national ambient air quality standard for PM-2.5 (“24-hour PM-2.5 NAAQS”) by December 31, 2015.<sup>3</sup> ADEC has made no secret, however, that the measures offered in the current regulatory proposal are not sufficient to lower ambient PM-2.5 concentrations enough to meet the health-protective 24-hour PM-2.5 NAAQS—not by 2015 and not even by 2019.<sup>4</sup> As an excuse for this inaction, the Department apparently believes, unrealistically, that 70% of all potential residential and multi-residential customers in Fairbanks will utilize natural gas as fuel by 2019.<sup>5</sup>

No matter the ultimate, long-term potential for conversion to natural gas, community members need relief in the near term and the law requires it. More can and should be done now. Helpfully, the U.S. Environmental Protection Agency (EPA) has compiled an extensive list of strategies for reducing residential wood smoke that have worked in other communities, including cold-winter communities—yet ADEC has refused to propose most of these proven successful approaches.<sup>6</sup> These comments describe ways to strengthen ADEC’s proposed regulatory amendments and offer additional measures that should be adopted to address PM-2.5. For example:

- ADEC should revise its vague and flawed curtailment regulations. The proposed provisions should be revised to require that mandatory episodic burn bans will be imposed to prevent PM-2.5 pollution levels that exceed the national ambient air quality standard, not imposed after a violation occurs. The provision also must include a clear exemption for burning that is an owner’s sole source of heat or in financial hardship situations.
- ADEC should adopt a requirement that old, high-polluting stoves must be replaced with new, clean-burning models upon the resale of a home.
- The proposed fuel requirements should be amended to disallow the burning or, at the very least, sale of wet wood.
- ADEC should adopt and implement pollution prevention and control measures for coal-burning devices: an emissions standard should be instituted for new coal-burning devices and coal-burning device owners should be required to use the kind and quality of coal specified by the manufacturer’s product specifications.

In addition to adopting measures to reduce wood smoke from outdoor burning and solid fuel-fired heating devices, ADEC also must move quickly to limit emissions from industrial facilities and other point sources affecting the Borough—particularly because such sources account for up

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<sup>3</sup> 42 U.S.C. § 7513(c)(1); *see also* 78 Fed. Reg. 69,806, 69,809 (Nov. 21, 2013) (“[A]reas are subject to an attainment deadline under subpart 4 of no later than December 31, 2015.”).

<sup>4</sup> FNSB Fine Particulate Matter Air Quality Planning Presentation, Oct. 3, 2013, at 15, *available at* [http://dec.alaska.gov/air/anpms/comm/docs/fbxSIPpm2-5/assemblybreifing\\_7.pdf](http://dec.alaska.gov/air/anpms/comm/docs/fbxSIPpm2-5/assemblybreifing_7.pdf) (last viewed Jan. 23, 2014).

<sup>5</sup> *Id.* at 11-15.

<sup>6</sup> *See generally* EPA, Strategies for Reducing Residential Wood Smoke (Mar. 2013), attached as Ex. 2; *see also* FNSB Fine Particulate Matter Air Quality Planning Presentation, Oct. 3, 2013, at 16 (identifying additional options for accelerating PM-2.5 levels).

to 20% of ambient PM-2.5 concentrations in Fairbanks.<sup>7</sup> Measures to address PM-2.5 emissions from mobile sources may be needed as well.

Finally, we encourage ADEC and local authorities to support community members with non-regulatory programs that will ease the transition to cleaner-burning devices and reduce energy use. For example, the Borough should maintain its stove change out program and public education efforts. We also recommend the adoption of programs that would subsidize fuel oil use in lieu of wood or coal and promote home weatherization.

#### I. ADEC’S PROPOSED REGULATIONS AND ADDITIONAL MEASURES ARE NECESSARY TO PROTECT PUBLIC HEALTH.

As the starting point for these comments, we emphasize that improved regulations to address wood smoke and other sources of PM-2.5 pollution are necessary to protect the health and welfare of Fairbanks residents, especially children in the community.

Inhalable airborne particles, the main ingredient of smoke, haze, and airborne dust, are known to present serious air quality problems in many areas of the United States, including Fairbanks. As EPA has explained, the size of particles is directly linked to their potential for causing adverse health problems; PM-2.5 pollution, consisting of the finest particles (2.5 micrometers in diameter and smaller), poses the greatest danger.<sup>8</sup> Such particles can penetrate deeply into a person’s lungs and may even enter a person’s bloodstream.<sup>9</sup>

“An extensive body of scientific evidence” including literally “thousands of studies” shows that PM-2.5 pollution “is causally linked” to a wide range of serious health impacts, including asthma attacks, hospitalization and emergency room visits for cardiopulmonary diseases, chronic respiratory disease, reduction in lung function, cancer, and premature death.<sup>10</sup> Wood smoke “contains organic pollutants associated with the incomplete combustion of the wood,” including “benzene, formaldehyde, dioxin, and polycyclic aromatic hydrocarbons, all of which can cause cancer.”<sup>11</sup> Further, metals in PM-2.5 pollution can bioaccumulate and cause a variety of health problems, including harm to a person’s kidneys and central nervous system.<sup>12</sup>

Among the thousands of studies on the health consequences of PM-2.5 pollution is a study conducted by the Alaska Department of Health and Social Services that analyzed the association

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<sup>7</sup> FNSB Fine Particulate Matter Air Quality Planning Presentation, Mar. 15, 2012, at 18, *available at* [http://dec.alaska.gov/air/anpms/comm/docs/fbxSIPpm2-5/assemblybriefing\\_4.pdf](http://dec.alaska.gov/air/anpms/comm/docs/fbxSIPpm2-5/assemblybriefing_4.pdf) (last viewed Jan. 23, 2014).

<sup>8</sup> See EPA, Health and Environmental Effects of Particulate Matter (PM), Ex. 3.

<sup>9</sup> *Id.*

<sup>10</sup> EPA, The National Ambient Air Quality Standards for Particle Pollution; Particle Pollution and Health (Particle Pollution and Health), Ex. 4 at 1; 72 Fed. Reg. 54,112, 54,127-28 (Sept. 21, 2007).

<sup>11</sup> Northeast States for Coordinated Air Use Management (NESCAUM), Outdoor Wood Boiler Fact Sheet, Ex. 5 at 1.

<sup>12</sup> 68 Fed. Reg. 26,690, 26,693-94 (May 16, 2003).

between air quality and hospital visits in Fairbanks for the years 2003-2008.<sup>13</sup> That study concluded:

These data indicate that increased concentrations of ambient PM<sub>2.5</sub> levels in FNSB were associated with increased risk of hospitalizations due to cerebrovascular disease in all persons and respiratory tract infections in persons aged <65 years during the study period. . . .

These results are consistent with other studies conducted in the United States using similar methods that show associations between short-term PM exposure and hospitalization for cardiovascular and respiratory events.

Though even healthy adults may experience temporary symptoms from exposure to elevated levels of PM-2.5, “[p]eople most at risk from particle pollution include people with diseases that affect the heart or lung (including asthma), older adults, children, and people of lower socioeconomic status. . . . [P]regnant women, newborns, and people with certain health conditions, such as obesity or diabetes, also may be at increased risk of PM-related health effects.”<sup>14</sup> A recent study undertaken by the University of California underscored the danger of PM-2.5 air pollution to children, concluding that episodic early life exposure in monkeys can result in immune and lung function decrements that persist with maturity.<sup>15</sup>

EPA initially established national ambient air quality standards for PM-2.5 in 1997.<sup>16</sup> At the time, the agency established two standards: an annual standard of 15 µg/m<sup>3</sup> and a 24-hour standard of 65 µg/m<sup>3</sup>.<sup>17</sup> EPA published a revision to the 24-hour PM-2.5 standard in 2006, lowering it to 35 µg/m<sup>3</sup> to provide increased protection of public health and welfare.<sup>18</sup> Last year, EPA lowered the annual PM-2.5 NAAQS from 15 to 12.0 µg/m<sup>3</sup>, further strengthening the standard.<sup>19</sup>

Fairbanks was designated by EPA as a nonattainment area for the 24-hour PM-2.5 NAAQS on November 13, 2009.<sup>20</sup> Although EPA has yet to issue area designations for the new annual PM-2.5 standard, monitoring data indicate that the Borough is not attaining the annual air quality standard either. In other words, the air quality in Fairbanks is unhealthy, threatening community

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<sup>13</sup> Alaska Department of Health and Human Services, State of Alaska Epidemiology Bulletin No. 26, “Association between Air Quality and Hospital Visits – Fairbanks, 2003-2008” (Aug. 30, 2010), Ex. 18.

<sup>14</sup> EPA, “Particle Pollution and Health,” Ex. 4 at 1; *see also* “Toxicity beyond the Lung,” 122 Environmental Health Perspectives A29 (Jan. 2014), Ex. 17 (stating PM-2.5 exposure has been associated with increased risk of heart disease, insulin resistance, and diabetes).

<sup>15</sup> *See generally* Lisa A. Miller, Ph.D., “Persistent Immune Effects of Wildfire PM Exposure During Childhood Development” (July 16, 2013), Ex. 6.

<sup>16</sup> 62 Fed. Reg. 38,652 (July 18, 1997).

<sup>17</sup> *Id.* at 38,652.

<sup>18</sup> 71 Fed. Reg. 61,144, 61,144-45 (Oct. 17, 2006).

<sup>19</sup> 78 Fed. Reg. 3,086, 3,086 (Jan. 15, 2013).

<sup>20</sup> 74 Fed. Reg. 58,688, 58,702 (Nov. 13, 2009).

members with short-term and long-term health consequences and even premature death. ADEC must therefore move quickly to abate PM-2.5 air pollution in Fairbanks and reduce the unacceptable burden on public health and community wellbeing.

## II. THE CLEAN AIR ACT REQUIRES THAT ADEC EXPEDITIOUSLY ADOPT MEASURES TO PREVENT AND REDUCE WOOD SMOKE AND DEVELOP ADDITIONAL MEASURES TO REDUCE OTHER SOURCES OF PM-2.5.

The need to mitigate the negative health consequences of poor air quality in Fairbanks, standing alone, is good enough reason for ADEC to move forward expeditiously with regulations to reduce PM-2.5 pollution. However, not only is the adoption of strengthened regulations the right thing to do for the community, the law also requires it.

As noted above, Fairbanks was designated by EPA as a nonattainment area for the 24-hour PM-2.5 NAAQS on November 13, 2009.<sup>21</sup> Under section 189(a)(2) of the CAA, ADEC was required to submit to EPA a state implementation plan (SIP) designed to improve air quality “no later than . . . 18 months after the designation as nonattainment.”<sup>22</sup> Because EPA’s 24-hour PM-2.5 NAAQS designations were effective December 14, 2009,<sup>23</sup> a nonattainment SIP for Fairbanks was due no later than June 14, 2011. This deadline passed more than two years ago but ADEC has yet to propose a SIP to address the unhealthy 24-hour levels of PM-2.5 pollution in the Borough, let alone secure the final State and EPA approval required for such provisions to take the full force of law.

Commenters acknowledge that, in 2009, EPA misinterpreted the requirements of the CAA and informed ADEC that it would have a full three years to develop and adopt a nonattainment SIP for the 24-hour PM-2.5 NAAQS.<sup>24</sup> But even under this more permissive and ultimately unlawful deadline,<sup>25</sup> ADEC was required to develop and submit a SIP no later than December 14, 2012. This latter deadline passed more than one year ago, meaning ADEC simply has no excuse for its failure to develop and submit for EPA’s approval a nonattainment SIP.

Commenters are aware that EPA recently proposed to extend the PM-2.5 nonattainment SIP submission deadline until December 31, 2014.<sup>26</sup> ADEC should not count on such an extension, however, as EPA has no authority to reset a statutory deadline and EPA’s proposal to extend a deadline that actually was required by law to be shorter is absurd.<sup>27</sup> Instead of finalizing its

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<sup>21</sup> 74 Fed. Reg. at 58,702.

<sup>22</sup> 42 U.S.C. § 7513a(a)(2)(B); *see also NRDC v. EPA*, 706 F.3d 428, 436 (D.C. Cir. 2013) (finding EPA “must implement” its PM-2.5 standards “pursuant to Subpart 4”).

<sup>23</sup> 74 Fed. Reg. at 58,688.

<sup>24</sup> 74 Fed. Reg. at 58,689 (stating that “states must develop a State Implementation Plan (SIP) . . . that provides for attainment of the NAAQS as expeditiously as practicable” and “no later than three years from the effective date” of the agency’s designations).

<sup>25</sup> *See generally NRDC v. EPA*, 706 F.3d 428.

<sup>26</sup> 78 Fed. Reg. at 69,809.

<sup>27</sup> *See generally Earthjustice et al., Comments re Proposed Identification of Nonattainment Classification and Deadlines for Submission of Fine Particle State Implementation Plan Provisions*, 78 Fed. Reg. 69,806 (Nov. 21, 2013) (comments dated Dec. 23, 2013), Ex. 7.

proposed deadline extension, EPA may instead issue a formal determination pursuant to section 110(k)(1)(B) of the CAA finding that Alaska has failed to timely submit a nonattainment SIP addressing nonattainment of the 2006 24-hour PM-2.5 NAAQS in Fairbanks.<sup>28</sup> Issuance of such a “finding of failure to submit” will start the clock running on certain mandatory sanctions imposed by the CAA (e.g., heightened stationary source permitting requirements and a moratorium on most federal highway funds) beginning in 18 months;<sup>29</sup> it also will start the clock on a two-year deadline for imposition by EPA of a federal implementation plan (FIP).<sup>30</sup> The prospect of sanctions—along with EPA-imposed regulations—is good reason for ADEC to promptly adopt and secure approval for necessary PM-2.5 pollution prevention and control measures.

Unfortunately, ADEC’s failure to timely and lawfully develop a PM-2.5 nonattainment SIP means that Fairbanks likely will miss an even more critical deadline: the deadline to achieve improved air quality that meets the 24-hour PM-2.5 NAAQS. Under the CAA, Fairbanks is required to improve air quality and attain the 24-hour PM-2.5 NAAQS “as expeditiously as practicable but no later than the end of the sixth calendar year after” its 2009 designation as nonattainment—i.e., no later than December 31, 2015.<sup>31</sup> Whatever the deadline EPA purports to set for ADEC’s submission of a proposed nonattainment SIP, EPA has not proposed any change (nor could it, lawfully) to the statutory deadline for achieving attainment.<sup>32</sup> The 2015 deadline is quickly approaching. ADEC therefore must not delay its adoption of improved regulations to address wood smoke as well as new and strengthened requirements for other PM-2.5 sources.

### III. COMMENTS ON PARTICULAR PROPOSED MEASURES:

In this section, we set forth and provide detailed comments on each of the regulatory changes proposed by ADEC. In addition to providing feedback on the draft regulations, in those instances where the draft regulations are wholly inadequate, we have suggested appropriate substitute provisions.

#### A. Proposed amendment of 18 AAC 50.065(f):

*Proposal –*

18 AAC 50.065(f) is amended to read:

(f) **Wood Smoke Control and PM-2.5 Non-Attainment Areas.** Open burning is prohibited between November 1 and March 31 in **all [A] wood smoke control areas [AREA] identified in 18 AAC 50.025(b) and in all PM-2.5 non-attainment areas identified in 18 AAC 50.015(b)(3).**

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<sup>28</sup> 42 U.S.C. § 7410(k)(1)(B).

<sup>29</sup> *Id.* § 7509(b); 40 C.F.R. § 52.31(d).

<sup>30</sup> *Id.* § 7410(c)(1).

<sup>31</sup> *Id.* § 7513(c)(1); *see also* 78 Fed. Reg. at 69,809 (“[A]reas are subject to an attainment deadline under subpart 4 of no later than December 31, 2015.”).

<sup>32</sup> 78 Fed. Reg. at 69,809.

*Comments –*

- Restricting open burning in PM-2.5 nonattainment area(s) during the season of the highest ambient pollution concentrations is an appropriate, common sense measure. Community members can plan to conduct open burning during other times of year.
- The supporting documentation provided by ADEC does not explain how the dates for the open burning ban were chosen. If it has not done so already, ADEC should review historic ambient air quality data to assess whether air quality violations frequently occur before November 1 or after March 31 of each year. If exceedances of the 24-hour PM-2.5 NAAQS are common outside of the proposed range, the dates of the open burning ban should be extended to reflect the historic data.

B. Proposed amendment of 18 AAC 50.075(b):

*Proposal –*

18 AAC 50.075(b) is amended to read:

(b) **The department may prohibit operation of** [A PERSON MAY NOT OPERATE A] wood-fired heating **devices** [DEVICE] in an area for which the department has declared an air quality episode under 18 AAC 50.245.

*Comments –*

- This proposed amendment constitutes an obvious weakening of an existing state regulatory provision, replacing a mandatory requirement that limits air pollution during air quality episodes with one that affords ADEC unqualified discretion to do nothing during a declared air quality episode. The Department candidly acknowledges as much, describing this proposed amendment as an effort “to relax the current regulation.”<sup>33</sup> The proposed amendment does nothing to address PM-2.5 air pollution in Fairbanks. In fact, the proposed amendment undermines existing requirements to improve air quality.
- Not only is the proposed amendment counterproductive to efforts to reduce PM-2.5 air pollution in Fairbanks, it would weaken an existing requirement that also applies to sulfur dioxide, coarse particulate matter (PM-10), and carbon monoxide that applies statewide. Indeed, this provision was initially offered by ADEC to EPA for approval in 1998 “to incorporate provisions of the . . . PM-10 attainment plan for the Juneau PM-10 nonattainment area.”<sup>34</sup>
- This proposed amendment violates the CAA. Because 18 AAC 50.075 was approved as part of Alaska’s SIP in 1998,<sup>35</sup> to weaken it would violate section 110(l) of the Clean Air

<sup>33</sup> ADEC, Responses to Open House Questions Received October 2, 2013, Version 2 at 2.

<sup>34</sup> 63 Fed. Reg. 44,208, 44,208-09 (Aug. 18, 1998).

<sup>35</sup> 63 Fed. Reg. 63,983, 63,984 (Nov. 18, 1998) (“EPA is approving the following provisions of 18 AAC 50 as adopted by ADEC and effective on January 18, 1997: . . . Section 075”); *see also* EPA Region 10, Alaska SIP – Federally Approved Rules , Ex. 8 at 2.

Act—an “anti-backsliding” provision.<sup>36</sup> Section 110(l) forbids EPA from approving SIP revisions that impede a state’s attainment of any NAAQS or progress toward attainment, stating: “The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress . . . , or any other applicable requirement of this chapter.”<sup>37</sup> Replacing a mandatory provision designed to reduce pollution in a nonattainment area with a discretionary provision necessarily interferes with attainment and progress toward attainment. EPA previously disapproved such an effort by ADEC to roll back a key SIP requirement on the grounds that it violated the CAA’s anti-backsliding requirements.<sup>38</sup>

- The proposed amendment also violates the rule against “elusive and illusory” measures. EPA may not approve or otherwise credit state-proposed measures like the proposed amendment that may never become effective or be used.<sup>39</sup>
- According to materials posted on ADEC’s website, the Department proposed this amendment intending to retain flexibility and to prevent people from losing an essential source of heat.<sup>40</sup> The proposed amendment is misguided as it does much more than offer ADEC “flexibility.” Instead, it gives the Department unfettered discretion—both to ignore dangerous air quality episodes and to limit burning without exception.
- Instead of an amended provision that is overly discretionary and neglects to define any exceptions to curtailment, ADEC should adopt a provision that prescribes a mandatory burn ban for all air episodes, subject to an exemption for essential burners and circumstances of demonstrated financial hardship. This approach is recommended by EPA and has been “highly effective” in numerous other communities.<sup>41</sup> ADEC itself has acknowledged curtailment as an “effective program used in a number of other problem areas” including Juneau and the states of Oregon and Washington.<sup>42</sup>
- As a basic model, ADEC should adopt requirements that track the mandatory, episodic wood-burning curtailment program used in Sacramento, California.<sup>43</sup> There, “the curtailment program alone has resulted in 40 percent fewer days above the NAAQS for PM-2.5.”<sup>44</sup> Sacramento’s mandatory, episodic wood-burning curtailment program

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<sup>36</sup> 42 U.S.C. § 7410(l).

<sup>37</sup> *Id.*

<sup>38</sup> 63 Fed. Reg. at 63,984 (“EPA finds the request for removal of 18 AAC 50.110 to be unapprovable. Specifically, ADEC has not demonstrated that the removal of 18 AAC 50.110 would comply with the requirements for SIP revisions set forth in sections 110(l) and 193 of the Act.”).

<sup>39</sup> *Safe Air For Everyone v. EPA*, 488 F.3d 1088, 1100 (9th Cir. 2007); *Riverside Cement Co. v. Thomas*, 843 F.2d 1246, 1248 (9th Cir. 1988).

<sup>40</sup> ADEC, Responses to Open House Questions Received October 2, 2013, Version 2 at 2.

<sup>41</sup> EPA, Strategies for Reducing Residential Wood Smoke, Ex. 2 at 6.

<sup>42</sup> ADEC, Responses to Open House Questions Received October 2, 2013, Version 2 at 3.

<sup>43</sup> Sacramento Metropolitan Air Quality Monitoring District, Rule 421-Mandatory Episodic Curtailment of Wood and Other Solid Fuel Burning, Ex. 9.

<sup>44</sup> EPA, Strategies for Reducing Residential Wood Smoke, Ex. 2 at 6.

includes the following stages and exemptions:

- “The first stage occurs when PM-2.5 concentrations are forecast to exceed 31  $\mu\text{g}/\text{m}^3$ . The second stage of the curtailment program occurs when PM-2.5 concentrations are forecast to exceed 35  $\mu\text{g}/\text{m}^3$ . In addition to mandatory curtailment, a voluntary curtailment begins at 25  $\mu\text{g}/\text{m}^3$ .”<sup>45</sup>
- “During a Stage 1 no-burn day, burning is prohibited except in EPA-certified stoves or pellet stoves as long as they do not emit visible smoke. During a Stage 2 no-burn day, all wood-burning is prohibited.”<sup>46</sup>
- The rule explicitly exempts burning that is the sole source of heat and/or in financial hardship situations.
- “The rule does not apply to fireplaces and stoves that burn gaseous fuels.”<sup>47</sup>
- The foregoing concentration levels, staged curtailment requirements, and visible emissions requirement are appropriate for Fairbanks, as are the exemptions for burning that is the sole source of heat, wood burning in hardship situations, and the use gaseous fuels. Indeed, given the extremely cold winter and high price of fuel in Fairbanks, explicit exemptions from curtailment for a sole source of heat and financial hardship are an absolute necessity.
- To ease the impact of a mandatory, episodic wood-burning curtailment program on community members, we encourage responsible state and local officials to adopt a fuel oil subsidy program that would help offset the additional expense of fuel oil use.

C. Proposed new regulation 18 AAC 50.076:

*Proposal –*

18 AAC 50 is amended by adding a new section to read:

**18 AAC 50.076. Solid fuel-fired heating device fuel requirements.** (a) A person operating a solid fuel-fired heating device in areas identified in 18 AAC 50.015(b)(3) may only use the following fuels:

(1) For wood burning devices:

(A) clean wood;

(B) wood pellets made from clean wood;

(C) manufacturer recommended starter fuels including home heating oil, propane, natural gas or wood-based material for dual-fired hydronic heaters; and

(D) biomass fuels approved by the manufacturer.

(2) For coal burning devices:

(A) coal; and

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<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

(B) coal pellets.

*Comments –*

- We support this common sense regulation that necessarily and helpfully limits using the intended fuels within solid fuel-fired heating devices. Proper fuel use will reduce PM-2.5 emissions and improve device safety. Additionally, the proposed requirement to burn “clean wood” will reduce the emission of toxic chemicals associated with unclean or treated wood, including copper chromium arsenate, creosote, and pentachlorophenol.
- In order to further reduce PM-2.5 air emissions and enhance air quality, the proposed regulation should be amended to specify that only seasoned wood may be burned. Wood stoves do not operate as intended and do not achieve meaningful PM-2.5 emissions reductions when wet or “green” wood is burned.<sup>48</sup> The use of unseasoned wood is a significant concern in Fairbanks, as only 40% of the wood combusted in Fairbanks is adequately cured.<sup>49</sup>
- ADEC has expressed some reluctance to require dry wood burning owing to inadequate supply, citing a lack of sufficiently seasoned wood.<sup>50</sup> But most Fairbanks residents (58%) cut all of their own wood, with another 22% cutting at least some of it.<sup>51</sup> A requirement to burn dry wood would incentivize homeowners to cut and season wood properly and could be effective if paired with an educational campaign on how, with a little advance preparation, wood is easily seasoned.
- In addition (or as an alternative) to directly regulating residents’ wood fuel use under the proposed 18 AAC 50.076, ADEC should forbid the sale of wet wood. Such a provision would force wood vendors to cut and season wood properly. The Sacramento Air Quality Management District instituted such a requirement, making it illegal to advertise, sell, or supply wood unless the wood moisture content is 20% or less.<sup>52</sup>
- The proposed regulation also should specify that coal burned in a coal burning device must be of the kind and quality specified by the manufacturer’s product specifications.

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<sup>48</sup> John Steinert, Alaska Department of Environmental Conservation Peer Review (Dec. 13, 2013) at 1 (stating that “[t]here are many reasons that would affect the emissions rate of a wood-fired heater [including] [w]et wood”); ADEC, Responses to Open House Questions Received October 2, 2013 Version 2 at 4 (stating “the use of wet wood leads to poor combustion and smoke”).

<sup>49</sup> FNSB Fine Particulate Matter Air Quality Planning Presentation, July 7, 2011, at 28, *available at* [http://dec.alaska.gov/air/anpms/comm/docs/fbxSIPpm2-5/assemblybriefing\\_1.pdf](http://dec.alaska.gov/air/anpms/comm/docs/fbxSIPpm2-5/assemblybriefing_1.pdf) (last viewed Jan. 23, 2014).

<sup>50</sup> *See* ADEC, Responses to Open House Questions Received October 2, 2013 Version 2 at 4.

<sup>51</sup> FNSB Fine Particulate Matter Air Quality Planning Presentation, Mar. 21, 2013, at 8, *available at* [http://dec.alaska.gov/air/anpms/comm/docs/fbxSIPpm2-5/assemblybriefing\\_6.pdf](http://dec.alaska.gov/air/anpms/comm/docs/fbxSIPpm2-5/assemblybriefing_6.pdf) (last viewed Jan. 23, 2014).

<sup>52</sup> EPA, Strategies for Reducing Residential Wood Smoke, Ex. 2 at 8 (describing Sacramento regulation); *see also* Sacramento Metropolitan Air Quality Monitoring District, Rule 417 -Wood Burning Appliances”, Ex. 10 at §§ 214, 303, and 501.2.

Some Fairbanks residents are burning coal that is not intended for use in home heating devices, creating a fire hazard.<sup>53</sup>

D. Proposed new section 18 AAC 50.077:

*Proposal –*

18 AAC 50 is amended by adding a new section to read:

**18 AAC 50.077. Wood-fired heating device standards.** (a) **Applicability.** These regulations apply to

(1) air quality and special protection areas identified in 18 AAC 50.015(b)(3);  
(2) any manufacturer, supplier, distributor or person intending to sell, lease, distribute, market, or convey a new wood-fired heating device for use in areas listed in (a)(1) of this section; and

(3) any person who owns or operates a wood-fired heating device in areas listed in (a)(1) of this section.

(b) **Prohibitions.** Except as provided in (4) of this subsection, no person subject to (a) of this section may supply, distribute, lease, sell, convey, or install

(1) a new hydronic heater unless the model has been

(A) tested by an EPA-accredited lab to meet the particulate matter emission limit of 2.5 grams per hour using the EPA hydronic heater test procedure, “Test Method 28 WHH for Measurement of Particulate Emissions and Heating Efficiency of Wood-Fired Hydronic Heating Appliances”, approved by EPA as of October 12, 2011 and adopted by reference; or

(B) listed on EPA’s Phase II White Tag Model list, provided the unit meets the emission standard in (A) of this subsection and its rated size is under 300,000 BTU as of *{the effective date of regulation}*;

(2) a new woodstove unless the model has been

(A) tested by an EPA-accredited lab to meet the particulate matter emission limit of 2.5 grams per hour using the applicable EPA Test “Method 28” and appropriate emission concentration measurement procedures “5G” or “5H” found in Appendix A to Part 60, revised as of December 23, 1971 and adopted by reference; or

(B) listed on EPA’s certified woodstove list, provided the unit meets the emission standard in (A) of this subsection and its rated size is under 300,000 BTU, as of six months after the *{effective date of regulation}*.

(3) a new wood-fired heating device greater than 300,000 BTU unless the model has been

(A) tested by an EPA-accredited lab to meet the particulate matter emission limit of 2.5 grams per hour using ASTM test procedures E2515-11,

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<sup>53</sup> Alaska Division of Fire and Life Safety Public Information Office, Heating with Alternative Fuels Can Be Dangerous (Oct. 25, 2013), Ex. 11 (“[I]t is . . . important to check the moisture content in the type of coal that you are burning. Only use a grade of coal that is recommended by the manufacturer of your heating equipment and do not put coal in a heating device that is not recommended to burn coal.”).

approved as of November 1, 2011, and E2618-09, approved as of February 15, 2009, and adopted by reference.

(4) the prohibitions in subsection (b) do not apply to:

(A) the supply, distribution, lease, sale, conveyance or installation of a new wood-fired device by a person subject to (a) of this section where that person has confirmed in writing with the buyer or user of the device that they intend the device will be installed and used in an area other than one of the areas described in (a) (1) of this section.

(B) the sale, lease or conveyance of a wood-fired heating device where the device is being sold, leased or conveyed as part of a single or multifamily residence and the device was installed in that residence prior to {*effective date of regulation*}.

*Comments –*

- We support the proposed emissions standard for new wood stoves to be supplied, distributed, leased, sold, conveyed, or installed in the Fairbanks PM-2.5 nonattainment area. A requirement to install new, cleaner-burning wood stoves is critical to improved air quality in Fairbanks as one old stove may emit the same level of PM-2.5 pollution as five dirty diesel buses.<sup>54</sup>
- A single low emissions standard, like the one proposed, is appropriate for all new devices—regardless of size or type. There should be no exception for small or large devices and there is no reason to scale the standard. Even devices larger than 300,000 BTUs should be required to meet the same emissions standard. A uniform emissions standard will allow homeowners and business owners to focus on the purchase of an appropriately sized unit.
- This requirement will not be burdensome on community members. As ADEC found and the Department’s peer reviewer confirmed, a fair number of clean-burning wood stove models are already available in Fairbanks.<sup>55</sup> The total list of manufactured models that have been certified by EPA is lengthy (21 pages in length),<sup>56</sup> and the number of clean-burning models available in Alaska is expected to increase if the proposed regulation is adopted.<sup>57</sup>
- Significantly, cleaner-burning wood stoves are not more expensive than dirtier models, as wood stove price is a function of size—not pollution controls. As ADEC itself found, an “analysis of wood stove prices in Fairbanks and the corresponding emission rates for the models sold did not show a correlation between PM<sub>2.5</sub> emission rates and wood heating device costs[,]” meaning “[c]ustomers should find economical choices available for

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<sup>54</sup> EPA, Burn Wise, Ex.12 at 2.

<sup>55</sup> See Colt, Peer Review Comments at 2-4.

<sup>56</sup> EPA, List of EPA Certified Wood Stoves (Dec. 2013), Ex. 13.

<sup>57</sup> Colt, Peer Review Comments at 2 (stating “other models would likely become available for sale in Fairbanks if new emissions standards were implemented.”).

lower-emitting stoves.”<sup>58</sup> This conclusion was confirmed by peer review.<sup>59</sup> Accordingly, there is no obvious downside to having residents install certified stoves only.

- Although cleaner-burning devices are not more expensive, even if they were, some or all of the additional cost would be “offset by the fuel savings associated with more efficient heating supplies.”<sup>60</sup> EPA reports that certified stoves use 30% less fuel.<sup>61</sup> Purchasers of cleaner-burning wood stoves and their neighbors also may enjoy savings in the form of lower health costs.<sup>62</sup>
- The exception in proposed section 18 AAC 50.077(b)(4)(A) (for devices to be used out of the nonattainment area) makes it too easy for sellers or buyers of wood stoves to subvert the requirement to buy new, clean-burning models. The exception should require more than just “confirm[ation] in writing with the buyer or user of the device that they intend the device will be installed and used in an area other than one of the areas described in (a) (1) of this section.” The buyer or user also should be required to specify in writing the address where the device will be installed and the writing should be notarized.
- Additionally, the word “installation” should be struck from proposed section 18 AAC 50.077(b)(4)(A). As currently written, the provision would allow installation of a stove within a prohibited area, subject to a written statement that it will be installed elsewhere. While it makes sense that someone might be allowed to sell a prohibited stove within the nonattainment area for use elsewhere, under no circumstance should actual installation of a prohibited stove within the prohibited area be allowed.
- Although we generally support the proposed new section 18 AAC 50.077, since the provision only would apply to newly constructed homes, it will do very little to reduce PM-2.5 pollution for decades. In fact, projecting emissions through 2019, the proposed requirement is only expected to provide a “1.4% additional reduction in non-attainment area PM<sub>2.5</sub> emissions from cleaner devices in new homes.”<sup>63</sup>
- To achieve meaningful PM-2.5 pollution reductions, a greater number of new, cleaner-burning stoves must be substituted for existing dirty stoves. In Libby Montana, for example, PM-2.5 emissions were reduced by 70 percent—but only after the majority of old stoves “were replaced with properly installed and vented EPA-certified wood

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<sup>58</sup> ADEC, Department Findings: The Need and Basis for More Stringent Wood-fired Heating Device Emission Standards (“Department Findings”) (Sept. 2013) at 20.

<sup>59</sup> Colt, “Peer Review Comments” at 4 (“My regression analysis therefore strongly confirms the stated result from the *Findings* that there is no statistical correlation between stove price and emissions rates after controlling for stove capacity.”); *see also id.* at 2 (“The point of this short discussion about data is that the data set employed is likely to *overstate* any potential tradeoff between lower emissions and higher prices.”) (emphasis in original).

<sup>60</sup> ADEC, Department Findings at 20, n.24.

<sup>61</sup> J. Reeb, Home Heating Fuels, Ex.1 at 2-3.

<sup>62</sup> Colt, Peer Review Comments at 5.

<sup>63</sup> FNSB Fine Particulate Matter Air Quality Planning Presentation, Oct. 3, 2013 at 11.

stoves.”<sup>64</sup> To speed this substitution, proposed section 18 AAC 50.077(b)(4)(B) (exempting residential transactions) should be eliminated and replaced with a provision requiring homeowners within the PM-2.5 nonattainment area to replace old wood stoves and hydronic heaters at the time of home sale. According to EPA, “[t]his requirement has proven effective in locations like Mammoth Lakes, CA; Washoe County, NV; and the State of Oregon.”<sup>65</sup>

- Although new stoves are not without cost (approximately \$2,000 - \$3,000), the expense of a stove replacement is modest compared to the average sales price of a home in Fairbanks, which has consistently exceeded \$200,000 since 2010.<sup>66</sup>
- One advantage of such an approach to PM-2.5 air pollution reduction is that it would be virtually self-enforcing. A home inspection is standard for a real estate transaction, with financing contingent on the house meeting relevant regulatory requirements. As a consequence, stove conversion would be financed and policed effectively through private transactions.
- Additionally, such home sale conversions—particularly in pollution hotspots—could be supported with public funds through the North Slope Borough’s stove change out program.
- The proposed new section 18 AAC 50.077 must also be strengthened with the institution of an emissions standard for new coal-burning devices to be supplied, distributed, leased, sold, conveyed, or installed with the Fairbanks nonattainment area. ADEC has indicated that it is disinclined to develop an emissions standard, as “significant research is needed to establish standards for these devices” and such “research, testing, and development would take time and resources.”<sup>67</sup> Commenters believe that it would be worthwhile to develop an emissions standard for new coal-burning devices in some form. As a practical alternative to the research-intensive approach suggest by ADEC, the Department could institute an opacity standard for new coal-burning devices, specifying that no visible emissions are allowed.

E. Proposed amendment of 18 AAC 50.245(a):

*Proposal –*

18 AAC 50.245(a) is amended to read:

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<sup>64</sup> EPA, Strategies for Reducing Residential Wood Smoke, Ex. 2 at 14; *see also* ADEC, Responses to Open House Questions Received October 2, 2013, Version 2 at 3 (“Libby, MT successfully used a wood stove change out program to lower its wintertime PM2.5 levels below the EPA standard and then followed that extensive change-out with a local regulation to prevent smoke.”).

<sup>65</sup> EPA, Strategies for Reducing Residential Wood Smoke, Ex. 2 at 8.

<sup>66</sup> *See, e.g.*, Christine Dugas, “Home sales way up in Fairbanks, Alaska,” USA Today (Feb. 2, 2010), Ex. 14; Trulia, Fairbanks Market Trends (last visited Jan. 22, 2014), Ex. 15.

<sup>67</sup> ADEC, Responses to Open House Questions Received October 2, 2013, Version 2 at 7.

**18 AAC 50.245. Air quality episodes and advisories.** (a) The department or a local air quality control program authorized by the department under AS 46.14.400 may declare an air quality episode and prescribe and publicize curtailment action if the concentration of an air pollutant in the ambient air has reached, or is likely in the immediate future to reach, any of the concentrations established in Table 6 in this subsection.

Table 6.  
Concentrations Triggering an Air Quality Episode

Episode Type	Air Pollutant	Concentration in micrograms per cubic meter {and in ppm where applicable}
Air alert . . .	<u><b>PM-2.5</b></u>	<u><b>56 (24-hour average)</b></u>
...		
Air warning . . .	<u><b>PM-2.5</b></u>	<u><b>251 (24-hour average)</b></u>
...		
Air emergency . . .	<u><b>PM-2.5</b></u>	<u><b>351 (24-hour average)</b></u>
...		

*Comments –*

- This proposed amendment is unacceptable and must be revised and strengthened as it does not protect public health in Fairbanks or promote attainment of the 24-hour PM-2.5 NAAQS. As ADEC acknowledges, “[t]he current 24-hour maximum and annual arithmetic mean concentrations of PM[-]2.5, as specified by the primary NAAQS, are 35 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and 12  $\mu\text{g}/\text{m}^3$ , respectively.”<sup>68</sup> Under the proposed amendment, an air alert is not even issued until pollution levels are almost double the air quality standard. And even then, responsive action is completely voluntary. Indeed, responsive action remains voluntary even in an “air emergency.” Requirements that are not triggered until after the air quality standard has been passed obviously do not promote attainment.
- ADEC attempts to justify this approach by arguing that only “sensitive groups” are affected at PM-2.5 levels below the proposed alert level.<sup>69</sup> The notion that ADEC is disinclined to protect “sensitive groups” is outrageous, as that category includes “[c]hildren, older adults, and those with heart and lung issues [who] are affected more

<sup>68</sup> ADEC, Department Findings at 2.

<sup>69</sup> ADEC, Responses to Open House Questions Received October 2, 2013, Version 2 at 5.

commonly than healthy adults.”<sup>70</sup> DEC regulations should protect all members of the community, especially Alaska’s children, elderly, and those with chronic illnesses.

- Moreover, ADEC is simply mistaken that only sensitive groups are affected by ambient PM-2.5 levels below the proposed air alert level. According to EPA, even “healthy” community members “may experience temporary symptoms from exposure to elevated levels of particle pollution.”<sup>71</sup> Indeed, studies have shown that health effects occur at 12  $\mu\text{g}/\text{m}^3$ —a concentration not only below the proposed air alert level, but below the ambient concentration set forth in the 24-hour PM-2.5 NAAQS itself.
- In light of the negative health consequences of short-term PM-2.5 exposure, even at relatively low levels, Table 6 of 18 AAC 50.245(a) should be revised to state that an air alert is triggered by a PM-2.5 concentration of 35 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).
- The proposed amendment to 18 AAC 50.245(a) is also inadequate because it fails to require curtailment, fails to specify what curtailment means, and neglects to establish appropriate exemptions. As an alternative to this discretionary and ultimately inadequate approach, ADEC must adopt a mandatory, episodic wood burning curtailment program, along with necessary exemptions. We identified appropriate provisions for such a curtailment program in our discussion above of the proposed amendments to 18 AAC 50.075(b).<sup>72</sup>

F. Proposed amendment of 18 AAC 50.245(b) & (c):

*Proposal –*

18 AAC 50.245(b) is amended to read:

(b) The department **or a local air quality control program authorized by the department under AS 46.14.400** will declare an air quality advisory if, in its judgment, air quality or atmospheric dispersion conditions exist that might threaten public health.

18 AAC 50.245(c) is amended to read:

(c) If the department **or a local air quality control program authorized by the department under AS 46.14.400** declares an air quality advisory under (b) of this section, the department **or a local air quality control program authorized by the department under AS 46.14.400** will . . .

*Comments –*

- The proposed amendment is unhelpful and should be rejected as it does not specify a single authority responsible for air alerts. Without a single, designated authority there is

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<sup>70</sup> ADEC, Department Findings at 14.

<sup>71</sup> EPA, “Health and Environmental Effects of Particulate Matter (PM),” Ex. 3 at 1.

<sup>72</sup> See *supra* at 7-9.

potential for confusion and inaction.

- To the extent ADEC believes that either the Department or a local entity might appropriately issue air advisories, the proposed regulatory language should be amended to make the lines of authority clear. To this end, the phrase “or a local air quality control program authorized by the department under AS 46.14.400” should be replaced with “or a local air quality control program authorized by the department under AS 46.14.400 **and designated as responsible.**”
- Obviously, ADEC should not delegate authority to a local air quality control program that is unwilling or unable to fully implement regulatory requirements.

G. Proposed amendment of 18 AAC 50.990(123)

*Proposal –*

18 AAC 50.990(123) is amended to read:

(123) “wood-fired heating device” means a device designed **or used** for wood combustion so that usable heat is derived for the interior of a building; “wood-fired heating device” includes wood-fired **or pellet-fired** stoves, fireplaces, **wood-fired forced air furnaces**, wood-fired **or pellet-fired** cooking stoves, **hydronic heaters** and combination fuel furnaces or boilers that burn wood; “wood-fired heating device” does not include a device that is primarily a part of an industrial process and incidentally provides usable heat for the interior of a building.

*Comments –*

- We believe the proposed amendment of 18 AAC 50.990(123) is appropriate.

H. Proposed amendment of 18 AAC 50.990

*Proposal –*

18 AAC 50.990 is amended by adding new paragraphs to read:

(135) “clean wood” means wood that has no paint, stains, or other types of coatings, and wood that has not been treated with preservatives including copper chromium arsenate, creosote, or pentachlorophenol.

(136) “hydronic heater” means a fuel burning device, including wood boilers and pellet boilers, designed to

(A) burn wood, biomass or other solid fuels;

(B) that the manufacturer specifies for installation in structures not normally occupied by humans (e.g., garages); and

(C) heats building space or water via the distribution, typically through pipes, of a fluid heated in the device, typically water or a water/antifreeze mixture.

(137) “solid fuel-fired heating device” means a device designed or used for wood or coal combustion so that usable heat is derived for the interior of a building; “solid fuel-fired heating device” includes wood-fired heating devices, coal stoves, coal forced air furnaces, coal-fired cooking stoves, coal-fired hydronic heaters and combination fuel furnaces or boilers that burn wood and coal; “solid fuel-fired heating device” does not include a device that is primarily a part of an industrial process and incidentally provides usable heat for the interior of a building.

(138) “woodstove” or “wood heater” has the meaning given to “wood heater” in 40 C.F.R. 60.531, revised as of October 17, 2000 and adopted by reference.

*Comments –*

- We have no objections to these definitions at this time.

#### IV. HYDRONIC HEATERS

ADEC requested information on potential additional requirements for hydronic heaters. Exacting requirements for hydronic heaters are not only appropriate but necessary because “the cumulative stack emissions from these appliances are usually significantly higher than other EPA-certified wood burning appliances.”<sup>73</sup> According to estimates from NESCAUM, hydronic heaters typically emit “at least twenty times more emissions than the current generation of EPA-certified woodstoves, and . . . as much particulate matter as 50 to 500 diesel trucks (depending on the truck age and level of control).”<sup>74</sup>

Given the significant potential PM-2.5 emissions from hydronic heaters, it is essential that ADEC adopt the low emissions standard set forth in proposed section 18 AAC 50.077(b)(1). However, because a manufacturer’s testing and/or EPA’s certification does not guarantee that a particular heater will perform (or be operated) as expected, these additional requirements—consistent with the model hydronic heater rule developed by NESCAUM<sup>75</sup>—should be adopted:

- Installation of new hydronic heaters shall be prohibited except in instances where they can be installed with a setback of at least 300 feet away from a property line.
- New hydronic heaters must have a permanent stack extending five feet higher than the peak of any roof structure located within 150 feet of the outdoor hydronic heater.

#### V. ENFORCEMENT

Commenters believe that revised air quality regulations must be matched with appropriate mechanisms for enforcement. Enforcement mechanisms must be sufficient to deter violations, but fair and not overly burdensome to community members, and not overly burdensome on responsible government officials either.

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<sup>73</sup> NESCAUM, Outdoor Wood Boiler Fact Sheet, Ex. 5 at 1.

<sup>74</sup> *Id.*

<sup>75</sup> See NESCAUM, Model Regulation for Outdoor Hydronic Heaters (Jan. 29, 2007), Ex. 16 at 4-5.

As we understand it, ADEC will be responsible for enforcement of the proposed air quality regulations in Fairbanks and, unfortunately, state authorities lack enforcement options other than “written notices of violation, compliance agreements, or in rare cases civil court actions.”<sup>76</sup> Stated differently, outside of seeking voluntary compliance, the only real enforcement mechanism is civil litigation, an approach that ADEC concedes is “rare.”<sup>77</sup> Litigation presumably is rare because that approach is expensive for the government and, in many instances, may be disproportionate to the violations at issue and may leave community members feeling besieged.

Instead, the institution of ticket authority and an administrative fining mechanism would be more appropriate. Other communities have adopted such an approach, providing incentives for compliance without disproportionately or unfairly penalizing community members. ADEC therefore should seek authority from the legislature to issue administrative penalties for violations of 18 AAC 50 or, at the very least, violations of 18 AAC 50 within a designated nonattainment area.

## VI. CONCLUSION

PM-2.5 air pollution levels in Fairbanks are dangerously high during the winter, posing an unacceptable and unlawful threat to the health and welfare of community members. Consistent with these comments, we encourage ADEC to promptly adopt and implement necessary and overdue PM-2.5 prevention and control measures.

Sincerely,

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<sup>76</sup> ADEC, Responses to October 16, 2013 Open House Written Questions at 2, 5.

<sup>77</sup> *Id.*

**Exhibits to Comments on Proposed Changes to Alaska Department of Environmental  
Conservation Regulations; Air Quality Fine Particulate Matter Regulations**

Exhibit No.	Description
1	J. Reeb, Oregon State University Extension Service, “Home Heating Fuels” (June 2009)
2	Environmental Protection Agency (EPA), Strategies for Reducing Residential Wood Smoke (Mar. 2013)
3	EPA, Health and Environmental Effects of Particulate Matter (PM)
4	EPA, The National Ambient Air Quality Standards for Particle Pollution; Particle Pollution and Health (undated)
5	Northeast States for Coordinated Air Use Management (NESCAUM), Outdoor Wood Boiler Fact Sheet
6	Lisa A. Miller, Ph.D., “Persistent Immune Effects of Wildfire PM Exposure During Childhood Development” (July 16, 2013)
7	Earthjustice, et al., Comments on Proposed Identification of Nonattainment Classification and Deadlines for Submission of Fine Particle State Implementation Plan Provisions, 78 Fed. Reg. 69,806 (Nov. 21, 2013) (comments dated Dec. 23, 2013)
8	EPA Region 10, Alaska SIP – Federally Approved Rules
9	Sacramento Metropolitan Air Quality Monitoring District (AQMD), Rule 421–Mandatory Episodic Curtailment of Wood and Other Solid Fuel Burning (amended Sept. 24, 2009)
10	Sacramento Metropolitan AQMD) Rule 417–Wood Burning Appliances (adopted Oct. 26, 2006)
11	Alaska Division of Fire and Life Safety Public Information Office, Heating with Alternative Fuels Can Be Dangerous (Oct. 25, 2013)
12	EPA, Burn Wise (undated)
13	EPA, List of EPA Certified Wood Stoves (Dec. 2013)
14	Christine Dugas, “Home sales way up in Fairbanks, Alaska,” USA TODAY (Feb. 2, 2010)

- 15 Trulia, Fairbanks Market Trends
- 16 NESCAUM, Outdoor Hydronic Heater Model Regulation (Jan. 29, 2007)
- 17 “Toxicity beyond the Lung,” 122 Environmental Health Perspectives A29 (Jan. 2014)
- 18 Alaska Department of Health and Human Services, State of Alaska Epidemiology Bulletin No, 26, “Association between Air Quality and Hospital Visits – Fairbanks, 2003-2008” (Aug. 30, 2010)