

# FNSB AIR POLLUTION CONTROL COMMISSION AGENDA

Tuesday April 4, 2017  
6:00 P.M.

City of North Pole, City Hall  
North Pole City Council Chambers  
125 Snowman Lane, North Pole, AK, 99705

1. Call meeting to order
2. Introductions
3. Approval of minutes
4. Messages from the Borough Mayor
5. Messages from the City of North Pole Mayor
6. Public comments on items not on the agenda, limited to 3 min. ea.
7. New Business
  - a. Serious PM<sub>2.5</sub> non-attainment SIP potential, new or amended, control measures review and discussion.
    - i. Public Comments, limited to 3 minutes each.
    - ii. Commission discussion and recommendations. (Action Item)
8. Commissioner comments
9. Adjournment

# Ultra-Low Sulfur Heating Oil

## Overview

Telephone surveys of homes located in the Fairbanks PM<sub>2.5</sub> nonattainment area indicate that ~95% are equipped to heat with fuel oil. Fairbanks heating oil use is a mix of 76% using # 2 heating oil (2,566 ppm sulfur) and 24% using #1 heating oil (896 ppm sulfur); thus, the average sulfur content of heating oil is currently 2,165 ppm. Since sulfate constitutes ~ 20% of the mass impacting monitors in Fairbanks and North Pole and most of the SO<sub>2</sub> emitted under wintertime inversions comes from home heating, a reduction in the heating oil sulfur content needs to be considered as a PM<sub>2.5</sub> control measure.

EPA mandated the production of ultra-low sulfur (15 ppm) Diesel fuel in 2006. Since this mandate addressed only motor vehicle fuel, no reductions in the sulfur content of home heating oil were required. Concerns about the need for reductions in PM<sub>2.5</sub>, SO<sub>2</sub> and regional haze, however led the Northeast states, where most heating oil consumption in the U.S. occurs, to implement laws mirroring the federal Diesel-fuel standard for motor vehicles.

In 2012, New York, which at the time had over a million households using heating oil, was the first northeastern state to set a home heating oil sulfur content standard of 15 ppm. Massachusetts, New Jersey and Vermont followed suit with a less-stringent 500 ppm standard in 2014, but are all going to require 15 ppm sulfur levels for heating oil by 2018. In 2016, Maine instituted a 50 ppm standard but will also require 15 ppm levels by 2018.<sup>1</sup> In addition many of the Mid-Atlantic States (including the District of Columbia) have also mandated the use of 15 ppm heating oil by 2018. Overall, 10 states plus selected communities in other states (e.g., Philadelphia) have ultra-low sulfur heating oil requirements.<sup>2</sup>

## Additional Benefits

Sulfur in heating oil is responsible for the formation of scale on burner and ducting surfaces, which leads to reductions in heat transfer efficiency and costs of annual maintenance and cleaning of these surfaces. The rate of scale formation is proportional to the sulfur content of the fuel. Multi-year, multi-residence studies of various grades of heating oil by the New York State Energy Research and Development Authority over the past two decades have demonstrated that use of ultra-low sulfur heating oil reduces scaling by 78% compared to the use of 2000 ppm sulfur heating oil.<sup>3</sup> Over an average heating season in New England, the reduction in scaling increases heat transfer rates and reduces fuel consumption by 11%. Maintenance and cleaning costs are also reduced substantially as annual scale removal becomes a once-every-four-year requirement.

## Additional Considerations

During the March 24<sup>th</sup> work session, Assembly members asked questions about changes in the distribution process required to affect the shift to 15 ppm heating oil. A brief survey of the northeast fuel suppliers identified the following issues:

Tank Cleaning – For areas that moved from 2,000 ppm or similar down to 500 ppm or similar, the distributors/wholesalers usually just blended 15 ppm and the high sulfur fuel to meet the 500 ppm limit. For transitions to 15 ppm, New Jersey distributors indicated that their rule was written such

<sup>1</sup> <http://blog.smarttouchenergy.com/ultra-low-sulfur-heating-oil-and-premium-fuels>

<sup>2</sup> <https://nefi.com/news/docs/heating-oil-standards-chart.pdf>

<sup>3</sup> <https://www.bnl.gov/isd/documents/89253.pdf>

that any high sulfur fuel that was in the inventory the day before the effective date of the new limit, was allowed to sell that higher sulfur fuel until it was gone. Due to this rule, no tank cleaning was required because as long as the higher sulfur fuel was in inventory prior to the effective date, it was legal for them to sell > 15 ppm fuel after the effective date. Over time the residual sulfur was removed and the whole stock came down to 15 ppm.

Transition - Most areas stepped down to 15 ppm in stages. First from their original limit (2,000-3,000 ppm) to 500 ppm and then to 15 ppm 2-4 years later. Connecticut provided a 120-day blend down period after the effective date during which the wholesalers and distributors could sell high sulfur product that they had in stock prior to the effective date. After the 120-day window, the 500 ppm limit was in full effect.

Access to 15 ppm Fuel - In order for the reduction to work, a suitable source of supply must be identified. Indications by all contacts were that refineries that were not already producing 15 ppm fuel were strongly against the reduction. The Connecticut contact indicated that the refineries selling high sulfur fuel would either decide to ship their product out-of-state or overseas to areas where high sulfur fuel is accepted or would have to reduce the sulfur content of their fuel once their state goes from 500 ppm to 15 ppm.

#### Best Available Control Measure (BACM) Analysis Requirements

Key requirements include an assessment of technological feasibility, economic feasibility for measures found to be technologically feasible and the earliest date at which a measure can be implemented. Since ultra-low sulfur Diesel fuel is not produced in Fairbanks, supply must be obtained from other sources and transported to the Borough for distribution. Information on in-state and potentially out-of-state supply is needed to assess the above noted requirements; including:

- Impact of the 15 ppm fuel requirement on arctic stove operation (storage clouding, etc.)
- Location and volume of available in-state supply sources, fuel specifications, costs (North Slope, North Pole, Valdez and Nikiski)
- Feasibility of in-state refinery modifications to provide needed volume (if needed)
- Location and volume of available out-of-state supply sources (e.g., Seattle, Canada, etc.)
- Transportation options/considerations/costs
- Local storage/distribution (e.g., expansion, conversion, cost, etc.)
- Assessment of statewide versus Fairbanks specific requirements
- Schedule for each transition step

The collection and assessment of this information, preparation of a BACM analysis and formulation of a regulatory mandate will require considerable effort and would stretch limited Borough resources. For this reason, consideration should be given to transmitting a request to ADEC to prepare an evaluation of the feasibility of this measure.

# Wood Burning Compliance

## Overview

A combination of emission inventory, photochemical modeling and speciation study findings indicate that wood burning is the dominant source of PM<sub>2.5</sub> impacting monitors in Fairbanks and North Pole. Recognizing the significance of wood burning emissions the Borough has established an air quality control program that focuses on managing the sale, resale, replacement, operation and restriction of solid fuel burning devices. A review of wood burning control programs in other communities shows many similarities in regulatory structure with the Borough's code. More stringent control program elements implemented in other communities include:

- Inspections – Aurora, Colorado authorized the City Manager (and his representatives) to inspect homes operating solid-fuel burning devices on high pollution days. In the event of entry refusal or restriction, a warrant for inspection without interference could be obtained.<sup>1</sup>
- Registration of Wood Burning Devices – San Joaquin Valley Air Quality Management District prohibits burning on selected curtailment days in homes that do not have registered wood burning devices.<sup>2</sup>
- Removal of Uncertified Wood Stoves – Tacoma required removal and disposal of uncertified wood stoves (or rendering it permanently inoperable) by September 30, 2015. Owners were required to provide documentation within 30 days of removal or rendering permanently inoperable.<sup>3</sup>
- Unlawful Operation of Solid Fuel Burning Device – Puget Sound specifies that visible smoke during an air quality alert constitutes “prima facie evidence of unlawful operation” which “may be refuted by demonstration that the smoke was not caused by a solid fuel burning device”.<sup>4</sup>
- Exemptions from No-Burn Periods – Cache Valley limits exemptions to homes which have registered the solid fuel burning device as the sole source of heat for the entire residence.<sup>5</sup>
- Installation Prohibition in New Construction – South Coast Air Quality Management District mandates no installation of a wood-burning device into any new development.<sup>6</sup>
- Curtailment Threshold – South Coast Air Quality Management District mandates mandatory winter burning curtailment when PM<sub>2.5</sub> concentrations are forecast to exceed 30 µg/m<sup>3</sup>.<sup>7</sup> The San Joaquin Valley mandates curtailment of nonregistered wood burning heaters, fireplaces, masonry heaters and outdoor wood burning devices when PM<sub>2.5</sub> concentrations are forecast to exceed 20 µg/m<sup>3</sup> but not exceed 65 µg/m<sup>3</sup>.<sup>8</sup> Tacoma lowered their threshold for calling burn bans from 35 µg/m<sup>3</sup> to 30 µg/m<sup>3</sup>.<sup>9</sup>

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<sup>1</sup>[https://yosemite.epa.gov/r8/r8sips.nsf/e5e850cc767bc8b3872573a9004cad73/bd3b257587d4a7de87257e0c00703faf/\\$FILE/ATTDNK22.pdf/\(c\)\(1\)%205%20CCR%201001-6,%20Reg%204.8.2a%20Aurora%20Ord%2087-118.pdf](https://yosemite.epa.gov/r8/r8sips.nsf/e5e850cc767bc8b3872573a9004cad73/bd3b257587d4a7de87257e0c00703faf/$FILE/ATTDNK22.pdf/(c)(1)%205%20CCR%201001-6,%20Reg%204.8.2a%20Aurora%20Ord%2087-118.pdf)

<sup>2</sup> <http://www.valleyair.org/rules/currnrules/r4901.pdf>

<sup>3</sup> <http://www.pscleanair.org/library/Documents/reg1.pdf>

<sup>4</sup> <http://www.pscleanair.org/library/Documents/1-13.pdf>

<sup>5</sup> <https://rules.utah.gov/publicat/code/r307/r307-302.htm>

<sup>6</sup> <http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-445.pdf>

<sup>7</sup> Ibid

<sup>8</sup> Op. cit.

<sup>9</sup> <http://www.co.fairbanks.ak.us/mayor/ClearTheAir/Working%20together%20for%20clean%20air%20-%20Swartzendruber.pdf>

- Penalties – Puget Sound regulations specify that Notices of Violation carry a maximum fine of up to \$1,000.<sup>10</sup> The State of Washington provides a penalty of not more than ten thousand dollars, or imprisonment upon conviction of a violation of air quality regulations.<sup>11</sup>

## Enforcement

While none of the regulatory programs specify the level of enforcement staffing, information presented by Phil Swartzendruber<sup>12</sup> at last year's Clear the Air Conference indicated a successful approach to enforcement in Tacoma that featured:

- Use of staff from local government partners on an on-call basis;
- An increase in the number of patrol teams from 2-3 to up to 40;
- Focused patrol hours on times when burning is more common (nights and weekends); and
- Development of a nighttime observation capability (digital camera capable of low light photography).

Their approach to expanding enforcement teams featured:

- Rental of other local agency staff during burn bans;
- Development of agreements/contracts with other cities and the county;
- Significant training on methods of observation and documentation; and
- Paying staff for their time.

One other feature of their enhanced enforcement was an increase in communications, outreach and education. A presentation by Justin Spenillo of EPA's Region 10 office to the Fairbanks APCC on March 22<sup>nd</sup> noted similar features in other wood smoke management programs in the Northwest, including:

- Involvement of the business community;
- Commitment to enforcement and implementation; and
- Political buy-in/community involvement.

Current Borough air quality enforcement efforts are limited to 2 staff members that individually cover 3-day shifts with overlap on a fourth day to provide 7-day/week coverage. This means the Borough has essentially one staff member/day addressing compliance throughout the nonattainment area. This level of enforcement is considerably less than seen in other PM<sub>2.5</sub> nonattainment communities. Certainly, it is lower than the surge level of enforcement implemented in Tacoma. It also has a ratio of enforcement staff to population less than seen in Oakridge, Oregon where a part-time Code Enforcement Officer jointly patrols with Lane Regional Air Protection Staff in a community with a population of 3,200 people.

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<sup>10</sup> <http://www.pscleanair.org/priorities/woodheating/Pages/burnbans.aspx>

<sup>11</sup> <http://app.leg.wa.gov/RCW/default.aspx?cite=70.94.430>

<sup>12</sup> Op. cit.

## Discussion

The summary of more stringent wood-burning program requirements provides examples of ordinance revisions with the potential to increase the effectiveness of the current Air Quality Control Program. The benefits of any revisions, however, will be dependent on the level of surveillance, enforcement and outreach employed. For this reason, the APCC needs to consider making recommendations for:

- Code revisions that increase program stringency to match or exceed levels observed in other PM<sub>2.5</sub> nonattainment communities;
- Identifying options to increase staff availability to aid enforcement efforts for the next heating season. It should be noted that ADEC has indicated a commitment to provide enforcement staff to aid Borough efforts for the next heating season. The level of staff that will be available is not specific, but is unlikely to be more than a single two-person team.
- The Borough currently operates a vibrant outreach program to enhance enforcement efforts, the continuation and possible expansion of that program should be a priority for the community.
- Revisions to current citation procedures to put the burden of proof on property owners that they are not operating a solid fuel burning device on days when Alerts are called.

The recent decision by the Assembly to eliminate the -15° F temperature threshold exempting compliance with Alerts will substantially increase the number of days Alerts will be called in North Pole and Fairbanks during the 2017/2018 heating season and therefore increase coverage of the Air Quality Control Program. The downside of the decision is that rate of compliance, particularly at lower temperatures, is likely to be lower. How these changes offset each other will determine the net air quality benefit to the community. Additional surveillance/enforcement efforts will be needed to ensure that the benefits desired will be achieved.

## Benefits

Factors affecting the benefits of implementing control program and staffing enhancements include:

- The portion of the solid fuel burning population affected;
- The number of days with elevated concentrations that are addressed;
- Change in the compliance rate;
- Conditions under which compliance occurs (lower rates of compliance during colder weather when concentrations are higher will reduce benefits); and
- Location of devices complying and not complying with Alerts.

When considering these factors, it should be apparent that with the exception of lowered burn-ban thresholds, code revisions that increase program stringency individually affect relatively small portions of the wood burning population. In contrast, changes in enforcement staffing will affect large portions of the wood burning population on the days when Alerts are called. As noted in Mr. Spenillo's presentation, the benefits of increased staffing are highly dependent on outreach and community involvement.

## Best Available Control Measure (BACM) Analysis Requirements

Key requirements include an assessment of technological feasibility, economic feasibility for measures found to be technologically feasible and the earliest date at which a measure can be implemented. Additional time is needed to assess the potential benefits from implementing more stringent program and staffing requirements. For this reason, no analysis of feasibility is available for these measures.