ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Amendments to:

State Air Quality Control Plan

Vol. II: III.D.7.11

Contingency Measures

Adopted

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Note: This document provides the adopted language of the 2024 Amendment to the Serious SIP for inclusion in this section of the State Air Quality Control Plan section to address the disapproval of the Serious SIP and the 2020 Amendments. The currently adopted section of the air quality plan can be found and referenced at the following internet site: Fairbanks PM2.5 Serious SIP

7.11. Contingency Measures, Overview and Chapter Outline

Section 172(c)(9) of the CAA requires nonattainment plans to include contingency measures that "provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the [applicable] attainment date[.]" Contingency measures are control measures that will be implemented in the future, and they may not be measures that are already implemented. *Bahr v. EPA*, 836 F.3d 1218, 1235 (9th Cir. 2016); *Ass'n of Irritated Residents v. EPA*, 10 F.4th 937, 946 (9th Cir. 2021).

Such contingency measures shall be structured to take effect, if triggered, with minimal further action by the State or EPA. 40 C.F.R. § 51.1014(a). They are triggered by an EPA determination that the area has failed to meet a reasonable further progress requirement, to meet a quantitative milestone in an attainment plan, to submit a quantitative milestone report, or to attain the NAAQS by the applicable attainment date. 40 C.F.R. § 51.1014(a)(1)–(4). The triggering events are also laid out in Alaska regulation at 18 AAC 50.030(c).

Contingency measures must consist of control measures that are not otherwise included in the control strategy or that achieve emissions reduction not otherwise relied upon in the control strategy, and each contingency measure must specify the timeframe within which its requirements become effective after an EPA determination. 40 C.F.R. 51.1014(b). The attainment plan submission must contain a description of the specific trigger mechanisms for the contingency measures and specify a schedule for implementation. 40 C.F.R. 51.1014(c).

This chapter outline is as follows:

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The adopted control measures discussed in this section are ready to be implemented, with only minimal action by the State, as expeditiously as practicable upon a triggering determination by EPA that the area has failed to meet a quantitative milestone, submit a required milestone report, meet reasonable further progress, or attain the NAAQS by the applicable attainment date.

7.11.1. Review of contingency measures in previous versions of this plan

In the Serious Area Plan submitted in 2019, DEC included in its regulations a measure that acted as the contingency measure for the serious area plan. The serious nonattainment area SIP for the FNSB $PM_{2.5}$ nonattainment area demonstrated that it was not possible for the area to reach attainment by the statutory serious area attainment deadline of 2019. In the 189(d) plan amendments adopted in November 2020, DEC included an additional contingency measure, because the contingency measure adopted in November 2019 with the Serious SIP submission was triggered in October 2020 and was no longer prospective.

7.11.1.1. Serious SIP, November 2019 adoption

This contingency measure targeted older EPA certified devices and has provided emission reduction benefits. In order to ensure that older wood heating devices are turned over at a substantial rate, DEC established a contingency measure in 18 AAC 50.077(n) that required older wood-fired heating devices with an emission rating above 2.0 g/hr manufactured 25 years before the effective date of a triggering EPA finding to be replaced before December 31, 2024. After 2024, the regulation continues to require that wood fired heating devices that are 25 years old be replaced, meaning that each year a number of existing stoves will reach the 25-year threshold and be required to be removed. This contingency measure will provide emission reductions in all future years. This contingency measure was triggered on October 2, 2020, the effective date of EPA's finding that the area failed to attain the standard by the outermost serious area attainment date of December 31, 2019.[1]

[1] 40 CFR Part 52, 85 Fed. Reg. at 54509 (Sept. 2, 2020).

7.11.1.2. 189(d) Amendment, November 2020 Adoption

In the 189(d) plan amendments adopted in November 2020, DEC established a contingency measure that would be triggered by an EPA finding and that would lower the Stage 2 air alert level in the curtailment program from 30 $\mu g/m^3$ to 25 $\mu g/m^3$ as included in Section III.D.7.12, Fairbanks Emergency Episode Plan, Table 7.12-1 "Air Quality Episode Thresholds and Exceptions/Contingency Measure." This is currently the only contingency measure in place that can be, but has not been, triggered.

EPA approved this contingency measure as SIP strengthening,[2] but determined that this contingency measure alone was insufficient to meet contingency measure requirements. EPA disapproved the contingency measure as not meeting the full contingency measure requirements[3] because:

1. The contingency measure would not achieve emission reductions equal to One Year's Worth (OYW) of Reasonable Further Progress (RFP);
2. The contingency measure would not achieve emission reductions of all plan precursors, including SO_2 and NH_3; and
3. Alaska did not include an adequate reasoned justification for why any additional potential contingency measures were infeasible.

One of the contingency measures selected with these 2024 Amendments includes lowering the alert levels in the curtailment program. Stage 2 alerts would be lowered from 30 $\mu g/m^3$ to 20 $\mu g/m^3$ rendering irrelevant the contingency measure that lowered the same alert level to 25 $\mu g/m^3$. The 189(d) contingency measure that lowered the Stage 2 alert.

7.11.2 Overview of Contingency Measure Analysis and Selection Process

DEC complied with Clean Air Act statutory requirements, final rules, and EPA guidance in its contingency measure analysis and selection process. The statutory requirements for contingency measures are found in section 172(c)(9) of the CAA.[4] EPA Contingency measure requirements are found in a series of final rules and guidance documents.[5] The statute requires contingency measures and triggers for such measures. The statute does not specify the amount of emissions reductions, the timing for achieving emissions reductions, or a specific process (e.g. a top-down BACT analysis) for the identification and selection of contingency measures. These and similar details are addressed by EPA regulations and guidance, which DEC reviewed to inform the amount, timing, and selection process for contingency measures.

[2] 40 CFR Part 52, 88 Fed. Reg. at 84663 (Dec. 5, 2023).
[3] *Id.*
[4] Section 172(c)(9) of the CAA requires nonattainment plans to include contingency measures that "provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the [applicable] attainment date[.]"
[5] *See* U.S. EPA, Office of Air Quality Planning and Standards, Air Quality Policy Division, DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter, March 17, 2023, at p. 5.

For emissions reductions, EPA has stated that the statutory purpose of contingency measures is to ensure continued progress towards attainment following a plan failure, such as failure to meet reasonable further progress (RFP) or failure to attain by the attainment date.[6] EPA maintains that contingency measures must provide meaningful emission reductions.[7] EPA has quantified meaningful emission reductions in final and draft guidance to be based on One Year's Worth (OYW) of RFP or on OYW of attainment progress.[8,9,10]

EPA has written that meaningful emission reductions should occur within 2 years of the triggering date. EPA's interprets the purpose of contingency measures to provide emission reductions that would bridge the gap during the period that a state would be developing a new SIP submission to address the underlying deficiencies that resulted in a triggering event.[11] In agency guidance, EPA states that 1 year is generally the appropriate timeframe for contingency measures to achieve reductions to bridge the gap.[12] While the preferred timing for achieving emission reductions is 1 year, EPA found that contingency measures that result in new emissions reductions during the second year following triggering will still serve EPA's interpreted purpose to bridge the gap and continue progress towards attainment.[13] EPA does not consider new reductions beyond 2 years to count toward OYW of progress for the contingency measure requirement.[14]

Turning to the selection process, DEC has not identified, and EPA has not provided, a stepwise process (like that for BACT and BACM) within EPA regulation or guidance. Rather, DEC identified the following non-exhaustive list of EPA requirements for contingency measures:

1. Contingency measures must be fully adopted and ready to implement.[15]
2. The SIP must contain appropriate trigger mechanisms for contingency measures.[16,17]
3. Contingency measures should consist of measures that are not relied upon in the control strategy for the area.[15,16]
4. Contingency measures should provide for OYW of emissions reductions.[15,16]

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[6] Air Plan Partial Approval and Partial Disapproval; AK, Fairbanks North Star Borough; 2006 24-Hour PM2.5 Serious Area and 189(d) Plan, Final Rule, December 5, 2023, 88 Fed. Reg. at p. 84664 (citing 59 FR 41998, August 16, 1994, at p. 42015; Assoc. of Irritated Residents v. EPA, 10 F.4th 937, at pp. 946–947 (9th Cir. 2021)).
[7] *Id.*
[8] *Id.*
[9] Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, Final Rule, August 24, 2016, 81 Fed. Reg. at p. 58093.
[10] U.S. EPA, Office of Air Quality Planning and Standards, Air Quality Policy Division, DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter, March 17, 2023, at p. 19.
[11] *Id. at 40.*
[12] *Id. at 41.*
[13] *Id.*
[14] *Id. at 42.*
[15] Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, Final Rule, August 24, 2016, 81 Fed. Reg. at p. 58093.
[16] *Id.*
[17] U.S. EPA, Office of Air Quality Planning and Standards, Air Quality Policy Division, DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter, March 17, 2023, at p. 20.

5. Emissions reductions from contingency measures should occur within 2 years of being triggered and preferably within one year.[18]
6. Use of inter-pollutant trading is acceptable, including substitutions of emissions reductions between direct $PM_{2.5}$ and $PM_{2.5}$ plan precursors to obtain OYW of emission reductions.[19]
7. States should provide a reasoned justification if their contingency measures achieve less than OYW of emissions reductions.[20,21]

Lacking a stepwise process, DEC began by calculating OYW of progress, provided in section 7.11.2.1. DEC then compiled a list of control measures that could provide meaningful emission reductions for either $PM_{2.5}$ or SO_2, provided in section 7.11.2.2. In section 7.11.3 each measure was analyzed to determine if the measure was technically feasible for consideration as a contingency measure by meeting elements 1, 2, 3, and 5 listed above. The analysis showed that it was not feasible to achieve OYW of SO_2 emissions reductions. DEC determined that inter-pollutant trading to achieve OYW of emissions reductions was preferable to providing a reasoned justification to achieving less than OYW of emissions reductions. Because the purpose of contingency measures is to ensure continued progress toward attainment, DEC inferred that achieving actual emission reductions were preferable to a written justification as to why emissions reductions were not feasible. Therefore, DEC did not provide a comprehensive reasoned justification for dismissal of all previously identified control measures. Having selected a package of contingency measures that satisfied OYW of progress for both $PM_{2.5}$ and SO_2 through inter-pollutant trading, the process was completed.

7.11.2.1 OYW of progress emission calculations and inter-pollutant trading

This section provides emission reduction calculations for the OYW attainment target defined in EPA's 2023 draft contingency measure guidance. DEC acknowledges that the OYW of attainment target defined in the 2023 draft contingency measure guidance is different than previous guidance which is based on OYW of RFP. While this chapter presents emission reductions compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

OYW Attainment Targets – In accordance with EPA's Draft 2023 Contingency Measure guidance, OYW attainment targets were calculated as the linear reductions in annual nonattainment area emissions of the modeling inventory between the 2020 Baseline year and the 2027 modeled attainment year, scaled by attainment year emissions as follows:

[18] *Id. at 40.*
[19] Clean Air Plans; Contingency Measures for the Fine Particulate Matter Standards; San Joaquin Valley, California, Final Rule, October 4, 2024, 89 Fed. Reg. at p. 80751-80752.
[20] U.S. EPA, Office of Air Quality Planning and Standards, Air Quality Policy Division, DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter, March 17, 2023, at p. 29.
[21] Air Plan Partial Approval and Partial Disapproval; AK, Fairbanks North Star Borough; 2006 24-Hour PM2.5 Serious Area and 189(d) Plan, Final Rule, December 5, 2023, 88 Fed. Reg. at p. 84665.

$$OYWA_p = \frac{(E_{Base,p} - E_{Attn,p})}{(CY_{Attn} - CY_{Base})} \times \frac{E_{Attn,p}}{E_{Base,p}}$$

Where $OYWA_p$ is One Year's Worth of attainment reduction target for pollutant p (in tons/episode day), $E_{Base,p}$ and $E_{Attn,p}$ are the Baseline and Attainment year nonattainment area emissions, respectively (in tons/episode day), and CY_{Base} and CY_{Attn} are the Baseline and Attainment calendar years, respectively.

As presented in Section 7.6.9 and 7.6.11 of the 2024 Amendment, $PM_{2.5}$ nonattainment area 2020 Baseline and 2027 Attainment year emissions are 2.947 tons/episode day and 1.744 tons/episode day, respectively. Substituting these values into the equation above yields an OYW attainment target for $PM_{2.5}$ of 0.102 tons/episode day. The SO_2 OYW attainment target of 0.115 tons/episode day was similarly calculated.

Based on these calculated targets, DEC's contingency measure package achieves OYW attainment for $PM_{2.5}$. However, since DEC's contingency measure package results in small SO_2 emission increases, the basic approach does not yield OYW attainment progress for both pollutants of significance. Therefore, as discussed below, OYW attainment was evaluated across both pollutants using an inter-pollutant trading technique used by EPA.

Use of Inter-Pollutant Trading (IPT) – The EPA considers it reasonable to apply the inter-pollutant trading (IPT) concept to contingency measures, including substitutions of emissions reductions between direct $PM_{2.5}$ and $PM_{2.5}$ plan precursors.[22] Although not specifically included in EPA's contingency measure guidance, EPA Region 9 included an evaluation of whether contingency measures for the San Joaquin Valley Federal Implementation Plan for Contingency Measures for the Fine Particulate Matter Standards could achieve OYW of RFP or OYW of attainment progress if inter-pollutant trading of emission reductions for $PM_{2.5}$ and precursors of significance were considered.[23] This approach utilized an ambient air quality-based weighting of emission reductions from both direct $PM_{2.5}$ and precursors to combine reductions across all pollutants of significance for comparison to OYW attainment. While this chapter presents emission reductions compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

For the Fairbanks 2024 Amendment Plan, a local speciated monitoring and model study[24] indicates that secondary sulfate (i.e., that converted to $PM_{2.5}$ from SO_2) represents no more than 10% of total ambient $PM_{2.5}$ across the Fairbanks nonattainment area during episodic wintertime conditions. To evaluate use of IPT for OYW attainment in Fairbanks, DEC conservatively assumed SO_2 contributes 20% to ambient $PM_{2.5}$, corresponding to a ratio of 5:1 of SO_2 emissions to total $PM_{2.5}$. Using this 5:1 ratio, the 0.038 tons/episode day increase in SO_2 emissions from

[22] Federal Implementation Plan for Contingency Measures for the Fine Particulate Matter Standards; San Joaquin Valley, California, 88 Fed. Reg. 53431, 53439 (Aug. 8, 2023).
[23] *Id.* at n. 63 (noting that EPA previously approved IPT for CMs in the 2008 San Joaquin Valley plan, 79 Fed. Reg. 29327 (May 22, 2014), as well as for showing that aggregate commitments for emissions reductions have been met, for example in 85 Fed. Reg. 44192).
[24] A. Moon, et al., "Primary Sulfate Is the Dominant Source of Particulate Sulfate during Winter in Fairbanks, Alaska", ACS EST Air 2024, 1, 139−149.

the contingency measure package shown in Table 7.11-3 was discounted by 20% and added to the non-overlapping 0.142 tons/episode day $PM_{2.5}$ reduction, yielding an inter-pollutant combined reduction of 0.134 tons/episode day as follows:

$0.142_{PM2.5}$ + 20% × (-0.038_{SO2}) = 0.142 – 0.008 = 0.134 tons/episode day

Similarly, the OYW attainment target with inter-pollutant trading using a 5:1 SO_2 to $PM_{2.5}$ ratio was calculated as:

0.102 tons/day $OYW_{PM2.5}$ + 20% × 0.115 tons/day OYW_{SO2} = 0.125 tons/day

Thus, using a conservative 5:1 ratio for SO_2 to $PM_{2.5}$ in Fairbanks during winter, the OYW of attainment target with inter-pollutant trading is 0.125 tons/day.

7.11.2.2 List of contingency measures considered

DEC identified the following measures as possible contingency measures to consider for both $PM_{2.5}$ and SO_2 emissions reductions:

1. Modifications and/or enhancements to the existing curtailment program.
2. Modifications and/or enhancements to the existing wood device removal program.
3. Major Stationary Source SO_2 controls.
4. Aircraft SO_2 controls.
5. Ultra Low Sulfur Diesel (ULSD) for home heating oil.
6. BACM 7, a pellet only rule requiring solid fuel-fired devices to meet stricter emission criteria in high pollution zones.
7. BACM 52, prohibiting operation and sale of small “Pot Burners”.
8. BACM 53, prohibiting use, sale, or exchange of used oil for fuel unless it meets constituent property limits.
9. BACM 60, vehicle idling restrictions.
10. BACM 61, fuel oil boiler upgrades and repairs.
11. BACM 62, fuel oil boiler replacements.
12. Increasing penalty dollar amounts for wood heater curtailment enforcement.
13. Lowering moisture requirements for commercial dry wood from 20% down to 10% or 15%.
14. Citation authority for wood heater curtailment enforcement.
15. Subsidizing the cost difference between #1 fuel oil and ULSD for space heating.
16. Adding the nonattainment area to the power cost equalization program or developing an equivalent program.
17. Selling royalty natural gas to the Interior Gas Utility for only the cost of liquefaction and transportation.
18. Subsidizing electricity for heat on days when there is an air quality alert.
19. Providing an electric heat source with an electricity voucher to homes with No Other Adequate Source of Heat (NOASH) waivers.

7.11.2.3 Best options to achieve meaningful reductions

Residential wood smoke emissions represent the largest contribution to $PM_{2.5}$ pollution in the non-attainment area. Figure 7.6-6 of Chapter III.D.7.06 shows that wood burning from residential space heating represents over 64% of $PM_{2.5}$ emissions in the nonattainment area. In Chapter III.D.7.09, attainment is successfully modeled by 2027 primarily by reducing residential wood smoke emissions from the space heating sector. While the control measures for residential wood smoke are permanent and enforceable regulations, the emission reductions are dependent on device turnover and/or large-scale behavioral changes within the community. Projections of device turnover and behavioral changes are represented by the phase in schedule for space heating controls presented in Table 7.9-3, which is reproduced below. Acknowledging that large-scale behavioral changes are difficult to achieve, DEC projected an aggressive but realistic phase-in schedule for the residential wood smoke controls with multiple controls under 50% phase-in by the 2027 modeled attainment year.

Table 7.9-3
Control Measure Phase-In Forecast for Inventory Years 2020-2027

Measure Summary and ID	Phase-In Percentages (%) by Year								Benefit Type
	2020	2021	2022	2023	2024	2025	2026	2027	
Borough Wood Stove Change Out Program (WSCO)	2,791[a]	3,055[a]	3,267[a]	3,576[a]	3,974[a]	4,524[a]	5,078[a]	5,628[a]	Accumulative as funded
SFBA Episodic Curtailment Program (Curtailment)[b]	30%	33%	38%	38%	38%	38%	38%	38%	Recurrent
Shift space heating from #2 to #1 oil (STF-12)	n/a	n/a	n/a	72%	95%	95%	95%	95%	One-Time
Requires commercially sold wood to be dry before sale (STF-13)	n/a	n/a	40%	40%	45%	45%	45%	50%	One-Time
Removal of all uncertified devices & cordwood OHHs (STF-17)	0%	5%	15%	30%	30%	30%	30%	30%	One-Time
2.0 g/hr and 0.10 lb/mmBTU certified emission rates for new or re-conveyed wood devices (BACM-R8)	22%	25%	30%	35%	35%	35%	35%	35%	Accumulative
Removal of coal heaters (BACM-48)	n/a	n/a	n/a	n/a	25%	25%	25%	25%	One-Time
Wood-fired devices may not be primary or only heating source (STF-22)	0%, 0%[c]	0%, 0%[c]	0%, 0%[c]	0%, 0%[c]	20%, 40%[c]	20%, 40%[c]	20%, 40%[c]	20%, 40%[c]	Partially Accumulative
NOASH/Exemption requirements (STF-23)	0%	10%	10%	30%	30%	30%	50%	50%	One-Time

n/a – Not applicable in years preceding start year.

A key point in evaluating the strengthening of any of these control measures under the context of implementation as contingency measures relates to the short 1-to-2-year implementation period under which contingency measure emission reductions must be achieved. Other than the WSCO

Program, control measures that depend on device turnover (which can take 20-30 years) and/or large-scale behavioral changes will generally be difficult to strengthen for providing sufficient short-term reductions when implemented as contingency measures.

A graphical representation of the emissions reductions that DEC relies on to achieve modeled attainment in 2027 is shown in Figure 7.11-1 and further demonstrates that DEC predominately relies on residential wood smoke controls to model attainment in 2027.

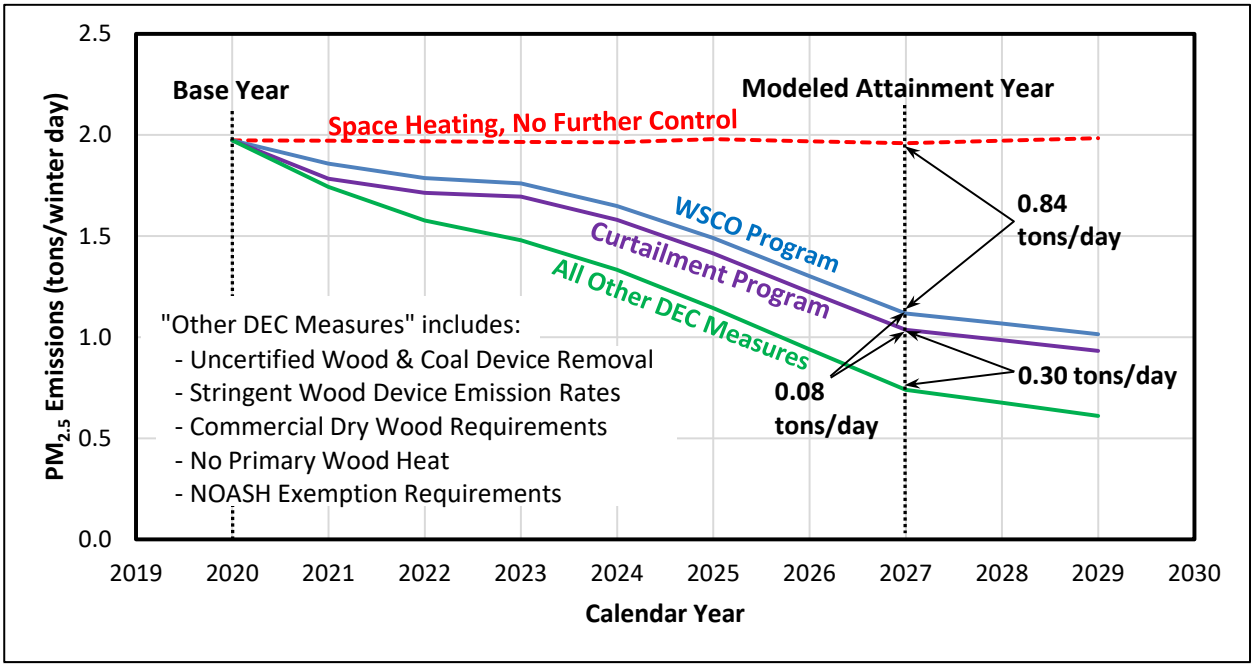


Figure 7.11-1. Nonattainment Area $PM_{2.5}$ Space Heating Emissions (tons/winter day) and Control Measure Reductions

A review of Table 7.9-3 and Figure 7.11-1 shows that there are still substantial emission reductions to be gained from control measures with less than 50% phase in by 2027. These unclaimed emission reductions are not relied upon to meet BACM, RFP, modeled attainment, or anything else in the control strategy, and therefore remain eligible to contribute towards the OYW of progress goal for contingency measures. After exhaustive reviews and implementing all feasible control measures and technologies required by the moderate, serious, and 189(d) plan revisions, there are not any remaining feasible control measures. Lacking unimplemented feasible control measures this far into the nonattainment process, this pool of unclaimed emissions reductions represents the best option to obtain meaningful emission reductions in contingency measures. Of the measures with less than 50% phase in by 2027, the curtailment program and the removal of uncertified appliances represent the highest potential for near term emission reductions because they do not rely on device turnover. DEC analyzed these two measures in sections 7.11.3.1 and 7.11.3.2 to determine which elements of the control measures could be improved to quickly increase the phase in, or compliance rate, as a contingency measure.

7.11.3 Contingency Measure Analysis

The subsections under 7.11.3 detail the analysis and reasoning leading to the proposed contingency measures followed by a discussion of all considered measures that were not selected for the proposed contingency measures.

7.11.3.1. Curtailment program alert level and increased compliance

DEC has reviewed the performance of the curtailment program and concluded that elements are suitable for adoption as a contingency measure. The analysis shows that a contingency measure should lower the alert levels and focus additional staffing on compliance and enforcement activities to achieve a higher compliance rate and greater emission reductions. Reviewed elements of the curtailment program include:

1. Real time monitoring of $PM_{2.5}$ levels.

DEC operates and maintains a federally approved ambient monitoring network, details can be found in Chapter III.D.7.5 ($PM_{2.5}$ Network & Monitoring Program). FNSB operates an additional network of low-cost sensors within the nonattainment area. Both FNSB and DEC make real time $PM_{2.5}$ data available for the public on their respective websites. Real time monitoring is sufficient to provide DEC with information necessary to forecast and call accurate alerts. Real time monitoring is sufficient to inform the public of current $PM_{2.5}$ concentrations. Dedicating additional resources to this portion of the curtailment program would not result in additional emission reductions.

2. Alert levels.

Under the provisions of 18 AAC 50.246, DEC declares air quality alerts in the FNSB nonattainment area based on two levels or thresholds. A Stage 1 air alert is called when air quality is forecast to be at or above 20 $\mu g/m^3$. A Stage 2 air alert is called when air quality is forecast to be at or above 30 $\mu g/m^3$. During Stage 1 and Stage 2 alerts residents are required to stop using solid fueled fired heating devices including but not limited to wood and pellet stoves. Stage 1 has allowances for the cleanest wood and pellet devices to operate under a waiver system, and Stage 2 has a more stringent waiver requirement where residents need to demonstrate the need to continue to use the higher polluting solid fueled heating appliances. DEC has determined that lower or more stringent alert thresholds will result in more alerts called and meaningful emission reductions.

3. Forecasting $PM_{2.5}$ levels to accurately predict and issue air quality alerts.

DEC relies on a staff meteorologist to determine when air alerts are issued and the appropriate stage level to issue. DEC staff use all available forecasting and data to inform decisions on when to issue air alerts. Additionally, a specialized tool for the nonattainment area has been developed, the AQ Alert Model. The AQ Alert Model is used by DEC air quality staff to assess the need for advisories. It retrieves a range of meteorological observations and forecasts for both surface and upper-air conditions and uses statistical equations developed from past experience turn the meteorological information into predictions of $PM_{2.5}$ concentrations at the monitors. The performance assessment presented in Appendix III.D.7.09 shows that both the Alert Model and

the DEC air advisory program perform more than sufficiently to predict and issue air quality alerts. Dedicating additional resources to this portion of the curtailment program would not result in additional emission reductions.

4. Communicating alerts to the community in a timely and effective manner.
Alerts need to be communicated to the public quickly, usually within 3 hours of notification, for the curtailment program to effectively reduce emissions. DEC notifies the public about air quality alerts, episodes, and exemptions through outreach methods including social media, TV, radio, electronic notification (email/text), alert phone line, electronic highway message boards, and the DEC Curtailment and Alerts web page. DEC has not identified another platform that could be used to communicate alerts within the time required. Dedicating additional resources to this portion of the curtailment program would not result in additional emission reductions.

5. Conducting outreach to ensure that the community knows the appropriate action to take.
Between FNSB and DEC a curtailment program has been operating since the winter of 2015-2016. During those 9 years, significant outreach regarding the curtailment program has been conducted, and as a result the community has a high awareness of the curtailment program. DEC contracted with a professional marketing firm to develop strategies for creative material, platform selections, and ad purchases. As a representative example, during the 2023-2024 winter DEC conducted a multiplatform campaign around the curtailment program. The campaign had significant online presence on the following platforms: Facebook, Hulu, StackAdapt, YouTube, iHeart Media, Pandora, and Spotify. A direct mailer on the curtailment program was sent to all residential addresses within the nonattainment area. Traditional radio and television ads were also run. Recent market analysis shows that DEC's marketing campaign is above industry benchmarks for all of the online platforms with the exception of digital radio performance. Dedicating additional resources to this portion of the curtailment program would not necessarily result in additional marketing reach or additional emission reductions.

6. Analyzing and processing waivers.
Waivers represent exemptions to the curtailment program. Lower emissions correspond to a lower number of waivers. During the 2023-2024 winter there were 13 active NOASH waivers and 24 active Stage 1 waivers. The waivers represent an incredibly small fraction of the approximately 14,000 solid fuel burning appliances estimated to be in the nonattainment area. Further reduction of waivers is infeasible and therefore dedicating additional resources to this portion of the curtailment program would not result in emission reductions.

7. Assessment of compliance rate.
DEC conducts assessments of the compliance rate each winter, as described in Appendix III.D.7.09. Collecting additional observations of Alert compliance would provide marginal improvements in the statistical significance of estimates of the compliance rate but would not result in additional emission reductions. Therefore, dedicating additional resources to this portion of the curtailment program would not result in emission reductions.

8. Compliance observations and enforcement activities.
Compliance observations in North Pole and Fairbanks are difficult to conduct and resource intensive from a staffing perspective. The observations require daylight and are limited to

generally between 10:30 am and 2:30 pm during the winter curtailment season. Only a small fraction of households can be observed during a given air quality alert with current staffing levels. Observed violations require a significant administrative workload to resolve. DEC has determined that dedicating additional resources to this portion of the curtailment program would increase the compliance rate and result in emission reductions by increasing the number of observations made and adding capacity to move observed violations through the administrative process. Details regarding the number of staff hours required to achieve the increase in compliance rate are provided in section 7.11.4.1 and enforceable commitments are provided in section 7.11.4.3.

7.11.3.2. Enhanced wood device removal and increased compliance

DEC reviewed the performance of wood device removal and concluded that elements are suitable for adoption as a contingency measure. The analysis shows that a contingency measure should focus additional staffing on compliance and enforcement activities to achieve a higher compliance rate and greater emission reductions. Reviewed elements of the wood device removal program include:

1. Implementation timelines.

There are multiple timelines for implementation of various components of the wood device removal requirements. In January 2020, the regulations adopted with the Serious SIP submission required that wood devices without a valid certification from EPA, i.e., uncertified wood devices, had to be removed but only during real estate transactions. In October 2020, a contingency measure was triggered that included a subset of older and higher emitting EPA-certified devices to be removed, but only during real estate transactions. After December 31, 2024, the removal requirement is significantly broadened by not being limited to only real estate transactions. After December 31, 2024, all existing uncertified wood devices along with older and higher emitting EPA-certified devices are required to be removed. Assuming that any contingency measure would be triggered after December 31, 2024, there are no implementation timelines that could be expedited as a contingency measure.

2. Emission thresholds for removals.

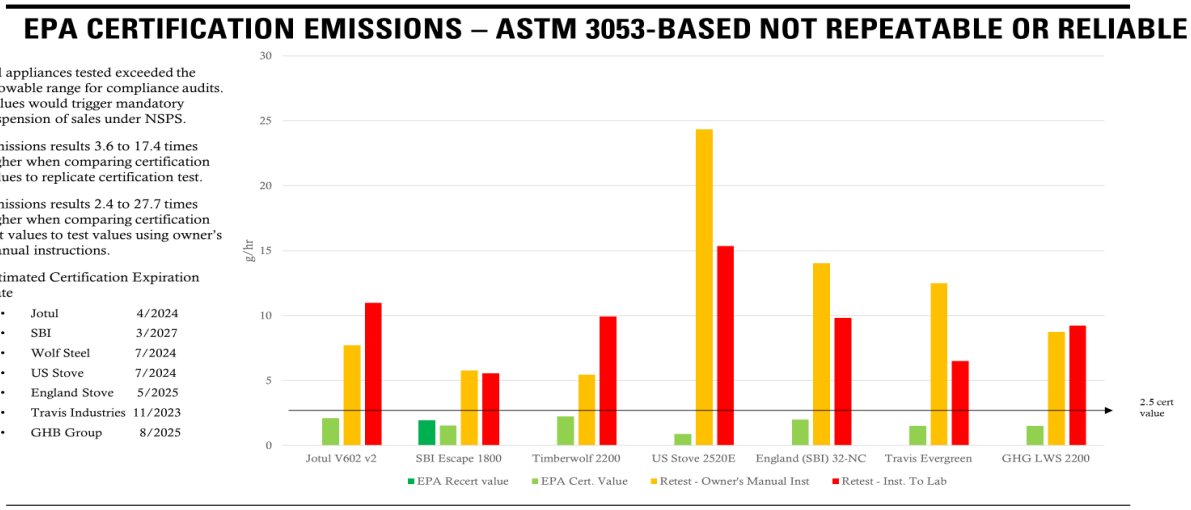
Like lowering the alert levels for curtailment, DEC considered lowering the emission thresholds for removal. DEC's regulations require certain EPA certified wood devices to be removed in addition to all uncertified wood devices. DEC's current thresholds for removal are any wood devices with an EPA-certified value greater than 2.0 grams per hour (g/hr) and older than 25 years. DEC has been reviewing EPA wood heater certification reports since 2020. As a result of DEC's reviews and work by Northeast States for Coordinated Air Use Management (NESCAUM), it has been shown that EPA's wood heater certification program is not a reliable indicator of wood device emissions. NESCAUM's March 2021 report *Assessment of EPA's Residential Wood Heater Certification Program*[25] classified the EPA's wood heater program as "dysfunctional," highlighting deficiencies in lab testing, manipulation of test methods, ineffective third-party certifier system, and improper complicity between third-party reviewers and manufacturers. EPA's Office of Inspector General report issued a February 28, 2023, report

[25] https://www.nescaum.org/documents/nescaum-review-of-epa-rwh-nsps-certification-program-rev-3-30-21.pdf

titled *The EPA's Residential Wood Heater Program Does Not Provide Reasonable Assurance that Heaters Are Properly Tested and Certified Before Reaching Consumers*[26] that further validates DEC's position.

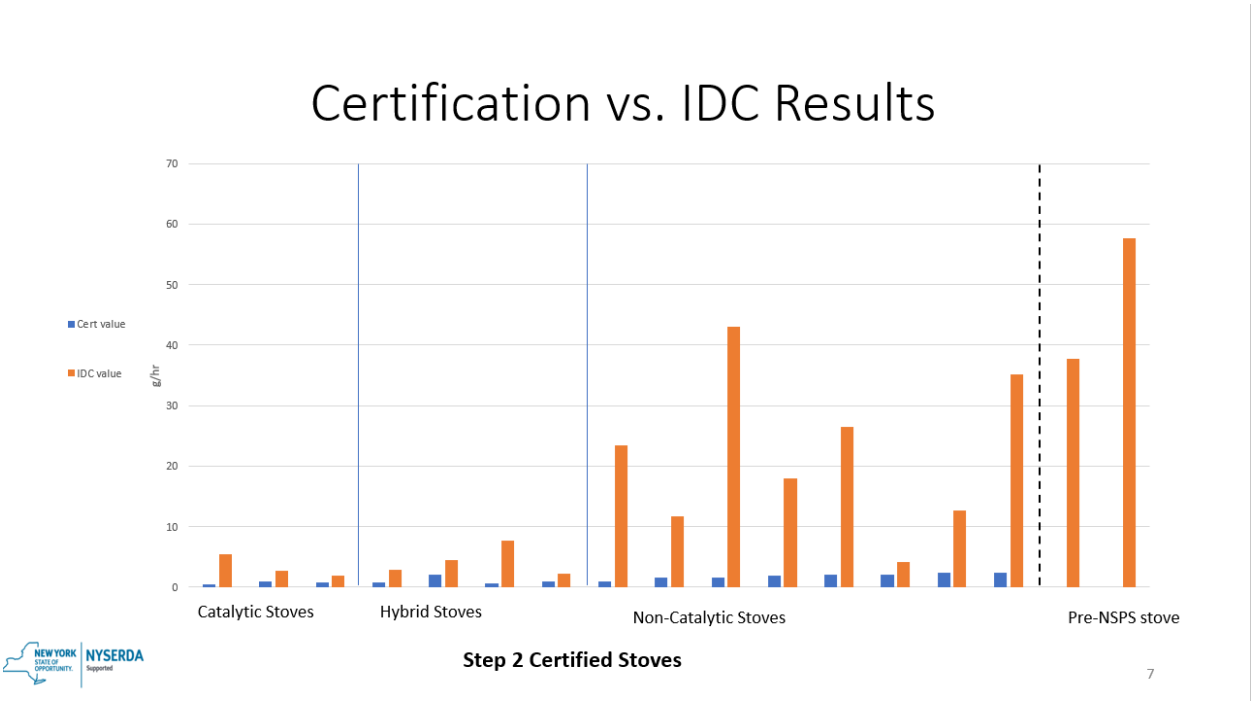
Testing data shown in Figures 7.11-2 and 7.11-3 show that lower certification values do not necessarily equate to lower emissions.

Figure 7.11-2, Certain EPA Certification Emissions are Not Repeatable or Reliable



[26] https://www.epaoig.gov/reports/evaluation/epas-residential-wood-heater-program-does-not-provide-reasonable-assurance

Figure 7.11-3, EPA Certification Test Results compared to Integrated Duty Cycle (IDC) Test Results



Based on the available body of evidence, DEC concluded that lowering the removal threshold below the current level of 2.0 g/hr could potentially *increase* emissions because some of the wood stoves with the lowest EPA certification value appear to have the highest emissions when retested.

3. Conducting outreach regarding removal of wood devices.

Because the current removal requirements are triggered only by a real estate transaction, DEC's outreach efforts have focused on educating real estate professionals. Between 2016 and 2021 DEC has sent 7 letters to real estate professional groups and has met with the local real estate association on multiple occasions. For date certain removal after December 31, 2024, DEC has sent two direct mailers, one in 2022 and another in 2024, to all residential addresses within the nonattainment area. FNSB and DEC have coordinated on ad campaigns to ensure that the community is aware of the DEC regulation and the December 31, 2024, deadline, while highlighting the FNSB change out program as providing financial incentive to comply with DEC's regulation. FNSB and DEC will continue to conduct outreach at similar levels as funding allows. Dedicating additional resources to this portion of wood device removal would not necessarily result in emission reductions.

4. Compliance observations and enforcement activities.

All historical compliance and enforcement efforts have been limited to real estate transactions because the date certain removal of December 31, 2024, has yet to be implemented. Present efforts rely substantially on self-reporting and referrals from the FNSB change out program, which is reflected in the current level of effort. DEC has determined that dedicating additional resources to this portion of the curtailment program would increase the compliance rate and

result in emission reductions. Details regarding the number of staff hours required to achieve the increase in compliance rate are provided in section 7.11.4.2 and enforceable commitments are provided in section 7.11.4.3.

7.11.3.3 Discussion of dismissed measures

The following measures were reviewed and determined to not be feasible contingency measures. The justification for dismissal of each measure is included.

7.11.3.3.1 Consideration of SO2 contingency measures

Table 7.6-8 from Chapter III.D.7.06 is reproduced below and shows SO_2 emissions by source sector in tons/day. In section 7.11.2.1 of this chapter, OYW of progress for SO_2 emissions is estimated at 0.115 tons/day. The only source sectors with sufficient SO_2 emissions to obtain OYW of progress are point sources, fuel oil space heating, and aircraft.

Table 7.6-8
2020 Baseline Episode Average Daily Emissions (tons/day) by Source Sector

	Modeling Inventory Grid 3 Domain Emissions (tons/day)					***Planning Inventory NA Area Emissions (tons/day)***				
Source Sector	**$PM_{2.5}$**	**NOx**	**SO_2**	**VOC**	**NH_3**	**$PM_{2.5}$**	**NOx**	**SO_2**	**VOC**	**NH_3**
Point Sources	0.58	13.54	6.63	0.04	0.088	0.58	13.54	6.63	0.04	0.088
Area, Space Heating	2.14	2.32	3.95	7.14	0.117	1.97	2.17	3.61	6.66	0.109
Area, Space Heat, Wood	2.06	0.27	0.05	7.02	0.074	1.89	0.23	0.04	6.55	0.067
Area, Space Heat, Oil	0.07	1.83	3.88	0.10	0.004	0.06	1.72	3.54	0.10	0.003
Area, Space Heat, Coal	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.000
Area, Space Heat, Other	0.02	0.22	0.02	0.01	0.039	0.02	0.22	0.02	0.01	0.039
Area, Other	0.18*	1.24	0.67	2.30	0.051	0.11	0.36	0.03	2.12	0.047
Mobile, On-Road	0.10	1.77	0.00	1.86	0.063	0.07	1.18	0.00	1.42	0.040
Mobile, Aircraft	0.19	0.65	8.27	0.31	0.000	0.12	0.43	5.44	0.15	0.000
Mobile, Non-Road less aircraft	0.12	0.84	0.00	3.32	0.002	0.09	0.29	0.00	2.64	0.001
TOTALS	3.32*	20.37	19.53	14.97	0.321	2.95	17.96	15.71	13.04	0.285

*Reflects corrected emissions for Other Area Sources within the modeling domain but outside the nonattainment area.

Point sources SO_2 controls were not identified as a contingency measure because a major stationary point source SO_2 precursor demonstration is included in Chapter III.D.7.08. That demonstration shows that SO_2 emissions from all existing major stationary sources located in the Fairbanks $PM_{2.5}$ nonattainment area do not contribute significantly to $PM_{2.5}$ levels. 40 C.F.R. § 51.1010 states that, with the major stationary point source SO_2 precursor demonstration, DEC is not required to identify and evaluate potential control measures to reduce SO_2 emissions from major stationary sources. The contingency measure guidance suggests that all control measures rejected as either technically or economically infeasible be reevaluated for feasibility as a contingency measure. The SO_2 control measures for major stationary sources were not identified or evaluated under 40 C.F.R. § 51.1010, were never rejected as technically or economically infeasible, and are therefore not identified as a contingency measure.

Aircraft are under federal jurisdiction. No controls have been identified for the aircraft source sector within the Minor, Serious, or 189(d) plan submissions. Therefore, there are no contingency measures to reduce SO_2 emissions within the aircraft source sector.

7.11.3.3.1.1. ULSD as a contingency measure

DEC also evaluated Ultra Low Sulfur Diesel (ULSD) heating oil as a candidate contingency measure, and ultimately rejected it from the proposed contingency measure package because any SO_2 emission reductions from a ULSD mandate would not be realized until **three years** after such a contingency measure was triggered. In the BACM analysis, DEC documented the following three major infrastructure issues associated with the feasibility of ULSD for the Fairbanks market:

1. *ULSD is infeasible because it cannot be produced locally* - The greater Fairbanks area has one refinery, which is located in North Pole and owned by Petro Star ("North Pole refinery"). For heating oil, it switched from making #2 to #1 fuel oil in September 2022, in response to the requirement and timeline in 18 AAC 50.078(b). The North Pole refinery has none of the infrastructure necessary to make ULSD.[27] To make ULSD, the refinery would need to build a new ULSD plant and connect it to the existing plant.[28] For the Fairbanks market, the size of that ULSD plant would be so small as to create a negative economy of scale.[29] Realistically, ULSD cannot be produced locally.

2. *Fuel transportation networks to Fairbanks could not logistically support a switch to ULSD heating oil* - In Alaska, ULSD is produced at two refineries: Petro Star produces it in Valdez, and Marathon produces it in Nikiski.[30] To get ULSD to Fairbanks it would first be transported to Anchorage, via barge for Petro Star and pipeline for Marathon, and then from Anchorage the fuel is transported by rail.[31] For Petro Star, the backup logistics would be to truck ULSD from Valdez to Fairbanks.[32] If ULSD was mandated for heating oil in the Fairbanks Nonattainment Area, Petro Star estimates that it would have to add 30-40 million gallons per winter of logistical capacity to transport heating oil to Fairbanks.[33]

   The existing logistical network for trucking and rail transport is operating at near capacity. Other fuel products for non-heating uses must also be shipped to Fairbanks, like gasoline and jet fuel. The Alaska Railroad, which runs 470 miles from Seward to Fairbanks (through Anchorage), is the primary and most economical mode of transportation for fuel going to

[27] Personal communication with Ryan Muspratt, VP, Petro Star by Jennifer Seely, Alaska Department of Law on behalf of ADEC (March 16, 2023).
[28] *Id.*
[29] *Id.*
[30] *Id.*
[31] *Id.*; *see also* McDowell Group, Statewide and Port of Alaska Long Range Fuel Forecast (November 20, 2020), available at https://www.portofalaska.com/wp-content/uploads/Alaska-PoA_Fuel_Forecast_Nov2020.pdf.
[32] *Id.*; *see also* FMATS Freight Mobility Plan (January 2019), available at https://fastplanning.us/wp-content/uploads/2019/07/freight-mobility-plan-for-approval.pdf.
[33] Personal communication with Ryan Muspratt, VP, Petro Star by Jennifer Seely, Alaska Department of Law on behalf of ADEC (March 16, 2023).

Fairbanks.[34] Trucking, which is more expensive than rail transport, is also at capacity in Alaska.[35] New truckers are not meeting the demand created by retiring truckers, and incomes from trucking in the continental United States have not increased, reducing the incentive for truckers to weather the dark and icy conditions in Alaskan winters.[36]

In Alaska, the fuel demand for heating, electricity, and transportation all peak in the winter.[37] It is cold and dark, and residents need more light and heat for more hours every day. Existing transportation capacity is insufficient to absorb the additional peaks in winter demand that would be caused by mandating ULSD.[38]

3. *The greater Fairbanks area has materially different fuel transportation conditions than rural Alaska, which uses a different ultra-low sulfur fuel* - Unlike Fairbanks, rural Alaskan communities that are not on the road or rail system use an ultra-low sulfur fuel.[39] This fuel is not the same as ULSD.[40] Rather, it is a hybrid product that can also be used for jet fuel ("ULS/jet"), and is produced by an Asia refinery with a different method from that used to produce ULSD.[41] Rural Alaskan communities need this multi-use fuel because of their limited fuel storage capacity. With ULS/jet, rural communities can use one storage tank and one fuel for both transportation and heat.

   The circumstances and reasoning for this type of ULS/jet product are different from the circumstances surrounding the heating oil needs in the Fairbanks North Star Borough. It has a much higher population[42] than rural Alaska communities and requires separate storage tanks for ULSD and other higher sulfur distillate oil. The logistics and costs associated with ULS/jet, and its transport from Asia through Bristol Bay to rural Alaska, are distinct from the logistics and costs that would be associated with transporting ULSD from different refineries, through different transportation methods, to the Fairbanks North Star Borough that needs more than one tank to survive the winter.

These three limiting factors impact the timeline for implementation and realization of SO_2 emission reductions. The infrastructure required to ensure an uninterrupted supply of ULSD to the Fairbanks North Star Borough include dedicated tanks to store ULSD and 30-40 million gallons of additional transportation capacity. The ULSD tanks would be filled during the summer months when usage is low and transportation by truck is safer and easier than in the dark and cold winter months. During the winter months, higher usage would deplete the storage in the tanks when the transportation infrastructure cannot keep up with heating needs of the

[34] *Id.*; *see also* FMATS Freight Mobility Plan (January 2019).
[35] Personal communication with Ryan Muspratt, VP, Petro Star by Jennifer Seely, Alaska Department of Law on behalf of ADEC (March 16, 2023).
[36] *Id.*
[37] *Id.*
[38] *Id.*
[39] 40 C.F.R. Part 80; 71 Fed. Reg. at 32450.
[40] Personal communication with Ryan Muspratt, VP, Petro Star by Jennifer Seely, Alaska Department of Law on behalf of ADEC (March 16, 2023).
[41] *Id.*
[42] Approximately 95,593, as of 2021. U.S. Census Bureau, QuickFacts: Fairbanks city, Alaska; Fairbanks North Star Borough, Alaska, available at https://www.census.gov/quickfacts/fact/table/fairbankscityalaska,fairbanksnorthstarboroughalaska/PST045221.

community. To prepare for the first winter of a ULSD mandate, the ULSD storage tanks would need to be commissioned and operational in the early spring to provide sufficient time to fill the tanks prior to the winter heating needs which ramp up in September or October. Any construction or repurposing of tanks would need to be completed during the short summer construction season. Given these constraints, two summers would be required to commission and fill the required ULSD storage tanks. During this time, the logistics of adding an additional 30-40 million gallons of transportation capacity could hopefully be addressed.

Once an uninterrupted supply of ULSD was made available to the community, the ULSD would need to be purchased and filled into all residential home heating oil tanks. Prior to any emission reductions being achieved, the ULSD would need to flush and displace all the existing #1 fuel in the residential tanks. With size ranges from 100 gallons to 1,500 gallons, up to a year's worth of heating oil can typically be stored in a residential tank. It is a fair assumption that most residential fuel oil tanks would be filled to capacity prior to any ULSD mandate, given the perceived price premium of ULSD compared to #1 fuel oil. Therefore, any SO_2 emission reductions from a ULSD mandate would not be realized until **three years** after such a contingency measure was triggered. Current and draft future guidance for contingency measures states that they should take effect within 60 days and should achieve emission reductions within one year (and two years at the maximum).[43] As such, a ULSD measure where reductions would not begin to be realized for three years after triggering is not eligible to be a contingency measure.

Having exhausted the available contingency measures for SO_2, DEC will be relying on excess $PM_{2.5}$ emission reductions and inter-pollutant trading as described in section 7.11.2.1.

7.11.3.3.2 BACM 7

DEC reviewed a pellet only measure as a $PM_{2.5}$ contingency measure. The pellet only measure reviewed through BACM was Measure 7 from Missoula Montana. The Missoula City-County wood heating control regulations require installation permits for the installation and use of all wood heating devices after July 1, 1986, in the Air Stagnation Zone (Section 9.202.1). Within the Air Stagnation Zone, installation permits are authorized only for pellet stoves emitting no more than 1.0 g/hr (Section 9.203.1.a).

Alaska adopted regulations under 18 AAC 50.077(a) – (e) as equivalent to Missoula's measure under BACM, and EPA approved Alaska's adopted measures as meeting BACM. While allowing cordwood stoves, Alaska's regulations adopted a new standard of 6.0 g/hr for the one-hour filter pull and required a review of the underlying test data. Alaska's regulations under 18 AAC 50.077(a) – (e) have resulted in pellet stoves being removed from Alaska's list that would be allowed under Missoula's 1.0 g/hr pellet only requirement.

Given all the documented issues with EPA's wood heater certification program adopting a pellet only requirement at 1.0 g/hr may not result in emission reductions beyond the limitations already

[43] EPA, *DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter* (March 17, 2023), at 40–41.

adopted under 18 AAC 50.077(a) – (e). There are also technical issues with adopting a pellet only requirement. During the 2018 stakeholder meetings, the community stated the need to maintain cordwood as an option. Pellet stoves must be plugged into an electric outlet to operate. Cordwood stoves do not need any external power source to operate. Many citizens rely on wood stoves as backup heat. Given the subarctic climate and periodic power failures, the community expressed real safety concerns for themselves and their families as well as concern about damage to property if wood stoves were not available as backup. While there are emerging technologies, none are proven. Due to the importance of these systems to ensure citizen safety in an arctic climate, it is not prudent to exclude an entire sector of proven residential heating technology that many citizens rely on for an immediate safety concern.

A pellet only measure would rely on device turnover to achieve emission reductions. In the control measure analysis DEC assumes a useful life of 20 years and a replacement rate of 5% per year for pellet appliances. At a penetration rate of 5% per year the $PM_{2.5}$ emission reductions realized within the first two years of a pellet only contingency measure would be insignificant. Therefore, due to:

1. An equivalent measure already adopted
2. Technological infeasibility and
3. Lack of emission reductions within 2 years of triggering

A pellet only measure was not selected as a contingency measure.

7.11.3.3.3 Additional BACM Measures

In addition to the Pellet Only (BACM 7) measure, there were several other BACM measures that were dismissed from inclusion as control measures within the expeditious attainment modeling based on economic infeasibility. These additional BACM measures were re-analyzed for suitability as contingency measures. They consisted of the following:

- BACM 52 - Prohibit Operation and Sale of Small “Pot Burners”;
- BACM 53 – No Use, Sale, or Exchange of Used Oil for Fuel Unless It Meets Constituent Property Limits;
- BACM 60 – Vehicle Idling Restrictions;
- BACM 61 – Fuel Oil Boiler Upgrade, Burner Replacement/Repair; and
- BACM 62 – Fuel Oil Boiler Upgrade, Boiler Replacement.

Emission reductions for direct $PM_{2.5}$ and SO_2 were calculated under the Serious SIP for each of the measures above in support of the BACM economic feasibility analyses noted above. The detailed emission reductions calculated for the economic analysis of each measure are contained in the Control Measure Analysis spreadsheets in Appendix III.D.7.07 [44]. The emission reductions for each measure analyzed in that spreadsheet (organized in tabs by measure) were calculated on an annual (i.e., tons/year) basis to support their use in the BACM economic cost-effectiveness analyses.

[44] https://dec.alaska.gov/media/19003/app-iii-d-707-bacm-economic-analysis-final.xlsx

Those annual reductions were converted to an episode average daily basis (tons/episode day) using a factor of 0.483 that was developed based on annual vs. wintertime energy use data for Fairbanks developed from local home heating survey data as follows:

$$Redn_W(tons/episode\ day) = \frac{Redn_A\ (tons/year)}{0.483\ x\ 365}$$

Where $Redn_W$ is the average daily wintertime episodic reduction and $Redn_A$ is the annual reduction estimated in the BACM spreadsheet.

Table 7.11-1 presents the resulting emission reductions for each additional BACM measure converted to a wintertime episodic basis under the context of contingency measures. As shown in Table 7.11-1, the analysis has assumed a 100% combined compliance/penetration rate for each of these measures. This is likely a very optimistic assumption to achieve within a one-year implementation period as contingency measures. Thus, the reductions contained in Table 7.11-1 should be considered theoretical upper-bound estimates.

Table 7.11-1
Additional BACM Measure Reductions as Potential Contingency Measures

No.	Control Measure	Compliance/ Penetration Rate (%)	Emission Reductions (tons/episode day)		
			$PM_{2.5}$	SO_2	Total IPT
BACM 52	Operation and Sale of Small "Pot Burners" Prohibited	100%	0.002	0.003	**0.003**
BACM 53	No Use, Sale, or Exchange of Used Oil for Fuel Unless It Meets Constituent Property Limits	100%	<0.0001	<0.0001	**<0.0001**
BACM 60	Vehicle Idling Restrictions[a]	100%	0.002	<0.0001	**0.002**
BACM 61	Fuel Oil Boiler Upgrades, Repair	100%	<0.0001	0.001	**<0.0005**
BACM 62	Fuel Oil Boiler Upgrades, Replacement	100%	<0.0005	0.006	**0.002**
TOTALS			**0.004**	**0.011**	**0.006**

[a] Emission reductions for the Vehicle Restrictions measure were calculated within separate spreadsheets under the BACM economic feasibility analyses are included in the public notice version of the 2024 proposed amendments to the Fairbanks PM2.5 Serious SIP under Appendix III.D.7.07, 2024 Amendment SIP BACM Cost Effectiveness Analysis – Revised Idling LDV – Measure 57-60-R20[45]

The Vehicle Idling Restrictions emission reductions reported in Table 7.11-1 include reductions for both light- and heavy-duty vehicles based on estimates calculated in the spreadsheets referenced by footnote at the bottom of the table.

As explained earlier in Section 7.11.2.1, establishment of the OYW attainment target for the combined contingency measure package included calculation of combined direct $PM_{2.5}$ and SO_2 emission reductions using a weighted inter-pollutant trading (IPT) method approved by EPA in other nonattainment areas. As calculated in Section 7.11.2.1, the OYW attainment target

[45] https://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-2024-proposed-amendment-serious-sip/

reduction that include IPT is 0.125 tons $PM_{2.5}$/episode day. Thus, the combined upper-bound reductions of 0.006 tons/episode day with IPT highlighted in the lower right of Table 7.11-1 represent only 5% of the IPT-based OYW target.

Based on the modest level of emissions reductions estimated for the combined additional BACM controls relative to the OYW target in conjunction with "best-case" compliance/penetration assumptions under a one-year implementation horizon, these additional BACM measures were excluded from the contingency measure package.

7.11.3.3.4 Increased penalty dollar amounts as a contingency measure

For a contingency measure, commenters also suggested that DEC increase penalty dollar amounts for wood heater curtailment enforcement. DEC has no existing limit on penalty dollar amounts, and binding its enforcement discretion would not be an effective contingency measure.

As described in the Attainment Demonstration chapter, DEC typically uses a basic 3-strike enforcement response method. During an air quality alert, DEC technicians drive around affected areas using randomized, pre-determined routes and document violations from public vantage points. Upon first observance of a violation, DEC issues an Advisory Letter that assumes the recipient was previously unaware of the curtailment requirements. Upon second observance of a violation, DEC issues a Compliance Letter that presses the recipient to reach out for options of compliance assistance. Upon third observance of a violation, DEC issues a Notice of Violation with an offer of expedited settlement that includes a penalty. Repeated violations beyond a third observance can be subject to increased penalties or other civil remedies within the State's discretion to return the violator to compliance. DEC reserves full enforcement discretion.

DEC is not limited and has not bound itself to any particular penalty amount. Its authority stems from AS 46.03.760(e) for violations of regulations and orders adopted under AS 46.14 (Air Quality Control). DEC has broad enforcement discretion to settle environmental violations with penalty amounts that deter noncompliance, and that are tailored to the violations at hand.

Evidence also suggests that most compliance comes from the first "strike," when the department typically sends an Advisory Letter after the first documented curtailment violation at a residence. During the 2021-2022 winter, the department sent 106 Advisory Letters, 30 Compliance Letters, and 6 NOVs. During the 2022-2023 winter, the department sent 230 Advisory Letters, 47 Compliance Letters, and 14 NOVs. And during the 2023-2024 winter, the department sent 198 Advisory Letters, 51 Compliance Letters, and 12 NOVs. The department documents repeat violations from residences across multiple years. While that takes time, the patterns suggest that most residences change their behavior after the first Advisory Letter, once they are informed of the legal requirement to comply with curtailment and where to learn about the air quality alerts. Recalcitrant curtailment violators can be subject to increased penalties and other civil remedies within the department's discretion. It is already within the department's discretion to increase penalties as needed, and it would apply that discretion as part of the enhanced curtailment enforcement within this contingency measure package.

7.11.3.3.5 Commercial dry wood down to 10 or 15%

DEC also evaluated and quantified emission reductions associated with reducing the "dry" wood moisture level for commercially sold wood as regulated under 18 AAC 50.076[46] from 20% down to either 15% or 10% if implemented as a contingency measure.
Emission reductions associated with commercially sold wood moisture requirements under 18 AAC 50.076 (at 20% moisture) were modeled as Measure STF-13 in the attainment demonstration and the underlying Control inventories. As explained in Section 7.9.1.1, emission reductions from Measure STF-13 included use of Aurora Energy's kiln.

The annual kiln capacity based on information from Aurora in 2020[47] and 2022[48] supporting those estimated reductions was 5,856 cords/year based on maximum drying capacity from April through November, with an average kiln-dried moisture level of 17.3%. That estimated annual kiln dried wood volume represents 31% of total commercially sold wood projected in 2028 (the year of evaluation of STF-13 emission reductions as a potential contingency measure). DEC received updated information from Aurora in 2024[49] on kiln capacity that considered use of a second kiln. Aurora indicated that with both kilns running all year they had the potential to dry over 7,000 cords of wood annually although their annual throughput in 2023 and 2024 ranged between 4,500 and 5,000 cords due to storage capacity for either raw logs or finished dried wood inventory in their current yard space as well as limitations associated with the seasonality of harvesting logs.

Moreover, outside Aurora's kiln, provisions in 18 AAC 50.076 allow wet or frozen wood to be commercially sold under specific circumstances. As explained in Section 7.9.1.1, an analysis of updated data from DEC's commercial wood seller database was conducted. It found that despite inclusion of data from the Aurora kiln, some sellers were not drying and measuring wood moisture content but instead selling wood in 8-ft rounds for which moisture measurements are problematic. As a result, the effective overall compliance rate for commercial wood sales for 20% moisture level (that included the Aurora kiln operated as described above), was calculated to be 40% in 2022, and it was projected to nominally increase over the attainment analysis horizon to 50% by 2027 to reflect local demand for dry wood. Thus, with this explanation of how the benefits from STF-13 were modeled in the Control inventories for the attainment demonstration, incremental reductions associated with reducing the dry wood moisture requirement from 20% to either 15% or 10% as a potential contingency measure were calculated as according to that electronic appendix detailed in Section 7.9.1.1.

As explained in Section 7.9.1.1 a detailed spreadsheet provided as an electronic appendix contains the calculations of emission reductions for each control measure for which reductions were quantified in support of the attainment demonstration. Using 2028 as the analysis year for a one-year contingency measure implementation, the STF-13 commercial dry wood emissions

[46] 18 AAC 50.076 requires wood commercially sold after October 1, 2021, as dried wood must meet (i.e., be at or below) a measured moisture content of 20% at the time of sale.
[47] Email from David Fish, Aurora Energy to Tom Carlson, Trinity Consultants, July 2, 2020.
[48] Email from Tom Carlson, Trinity Consultants to Nick Czarnecki, Alaska DEC, October 20, 2022.
[49] Email from Susan Shopper, Aurora Energy Solutions to Cory McDonald, Alaska DEC, April 11, 2024.

reductions (accounting for overlap with other wood-related control measures) were 0.062 tons/episode day and 0.002 tons/episode data for $PM_{2.5}$ and SO_2, respectively.

To account for the incremental emission reductions if STF-13 was strengthened using lower dry wood moisture levels, these reductions then served as the baseline for analysis as a contingency measure. Emission reductions were then calculated using the same STF-13 methodology and assumptions as in the attainment demonstration, but instead using dry wood moisture levels of 15% and 10% instead of 20%.

The results of this analysis are presented in Table 7.11-2. Two sets of emission reductions are shown: 1) With Overlap (reductions that are not adjusted to remove overlapping benefits); and 2) Overlap Removed (reductions that account for removal of overlapping effects of multiple control measures applied to the same source category, Residential Wood Burning).

Table 7.11-2
Emission Reductions from Strengthened Commercial Wood Moisture Levels

Control Measure Scenario	Compliance/ Penetration Rate (%)	Emission Reductions (tons/episode day)				
		With Overlap		Overlap Removed		
		$PM_{2.5}$	SO_2	$PM_{2.5}$	SO_2	Total IPT
Commercially Sold Wood Moisture Below 20% - 2028 Control Inventory	50%	0.079	0.002	0.062	0.002	0.062
Commercially Sold Wood Moisture Below 20% - Decrease to 15% Moisture	50%	0.093	0.003	0.073	0.002	0.073
Commercially Sold Wood Moisture Below 20% - Decrease to 10% Moisture	50%	0.107	0.003	0.084	0.003	0.084
Incremental Emission Reductions (15% vs. 20% moisture):				**0.011**	**0.000**	**0.011**
Incremental Emission Reductions (10% vs. 20% moisture):				**0.022**	**0.001**	**0.022**

The first row of Table 7.11-2 shows the "baseline" reductions from STF-13 as modeled within the attainment demonstration. The next two rows list the emission reductions calculated for STF-13 by dropping the dry wood level in 18 AAC 50.076 for commercially sold wood from 20% to 15% and 10%, respectively. The bottom two rows of Table 7.11-2 present the resulting incremental reductions (relative to STF-13 reductions contained in the Control inventory supporting the attainment demonstration). For example, the incremental direct $PM_{2.5}$ reductions (with overlap removed) from dropping the moisture level from 20% to 15% are 0.11 tons/episode day (0.073 – 0.062 = 0.011).

The "Overlap Removed" reductions for the 15% and 10% moisture levels were scaled from the ratio of the "With Overlap" and Overlap Removed reductions at 20% moisture that were rigorously calculated for implementation of STF-13 in conjunction with all other wood related control measures reflected in the attainment inventory. By example, the direct $PM_{2.5}$ reduction for 10% moisture with overlap removed of 0.084 tons/episode day was calculated as follows:

$$PM2.5\ Redn_{OR,10\%} = PM2.5\ Redn_{WO,10\%} \times \frac{PM2.5\ Redn_{OR,20\%}}{PM2.5\ Redn_{WO,20\%}} = 0.107 \times \frac{0.062}{0.079} = 0.084$$

And as explained earlier with establishment of the OYW attainment target and calculation of additional BACM measure emission reductions as candidate contingency measures, the direct $PM_{2.5}$ and SO_2 reductions were combined using appropriate inter-pollutant trading weighting as listed in the rightmost column of Table 7.11-2.

The incremental With IPT reductions highlighted in the bottom right of Table 7.11-2 are 0.011 tons/episode day and 0.022 tons/episode day for strengthened moisture thresholds of 15% and 10%, respectively. These reductions achieve 9% of the OYW target at 15% moisture and 18% of the OYW target at 10% moisture.

Finally, the analysis of strengthening the dry wood moisture level in 18 AAC 50.076 as a potential contingency measure assumed that the projected compliance/penetration rate in 2028 for STF-13 in the Control inventory would not be measurably improved under a short one-year contingency measure implementation period. In addition, as explained earlier these emission reductions are likely upper bound estimates as they reflect higher kiln throughout/capacity than has been achieved to date. As Aurora Energy has indicated to DEC, current throughput (even with a second kiln) is limited by yard capacity and seasonal log harvesting constraints. If the moisture level threshold in AAC 18 50.076 is reduced from 20% to either 15% or 10%, this would increase kiln drying times, and likely further limit overall annual kiln throughput while driving up costs.

Therefore, although theoretical $PM_{2.5}$ emission reductions with IPT range from 9% -18% of the OYW target if 18 AAC 50.076 moisture thresholds are reduced to 15% or 10%, the preceding analysis details several obstacles to implementation and achieving those theoretical emission reduction levels. DEC selected other contingency measures that would provide much larger and more certain reductions relative to the OYW target.

7.11.3.3.6 Citation authority as contingency measure

For a contingency measure, a commenter on EPA's action suggested that DEC be granted "citation authority" so that enforcement can be handled efficiently and in a timely manner. This comment is based on a false premise that obtaining citation (i.e. administrative penalty) authority for ADEC would increase the speed and efficiency of DEC's curtailment enforcement.

ADEC already has penalty authority for curtailment violations in AS 46.03.760(e), which it typically uses as described above (in 7.11.3.3.4) after the third or subsequent curtailment violation. Penalties are assessed in an Expedited Settlement Agreement (ESA), a short boilerplate settlement agreement that requires signature from the violator(s), the department, and an Assistant Attorney General from the Alaska Department of Law. The state attorney signs after the violator returns the ESA with their signature. That state attorney may look at the ESA before DEC issues it but does not delay the ESA in being transmitted to the curtailment violator(s). As such, obtaining citation / administrative penalty authority for DEC would not change the timeliness or efficiency of DEC's curtailment enforcement.

DEC also does not have the power to give itself administrative penalty authority for curtailment violations. Making that change to the state statutes would require a bill from the Alaska Legislature, which is not within DEC's control.

7.11.3.3.7 Other potential contingency measures identified

Commenters suggested other potential contingency measures for consideration in comments on EPA's January 10, 2023, proposed rulemaking for the Fairbanks $PM_{2.5}$ Serious Area and 189(d) Plans, Docket Number EPA-R10-OAR-2022-0115.[50] Their suggestions included:

1. Subsidize the cost difference between #1 fuel oil and ULSD.
2. Add Fairbanks and/or the nonattainment area to the Power Cost Equalization program or develop an equalization program for the area.
3. Sell royalty natural gas to the Interior Gas Utility for only the cost of liquefaction to LNG and transportation.
4. Subsidize electricity for heat on days when there is any air quality alert.
5. Provide an electric heat source with an electricity voucher to homes with no other adequate source of heat (NOASH) waiver.

Each of the 5 suggested contingency measures have two common elements. First, each measure is a subsidy for residential home heating. Second, each measure realizes emission reductions by encouraging residents, with economic incentives, to switch from wood heat to an option with fewer $PM_{2.5}$ emissions. DEC reviewed the suggested contingency measures and determined that the 5 suggested measures are not suitable as contingency measures for the following reasons:

1. In accordance with 40 C.F.R. § 51.1014(b)(1), contingency measures are control measures. Control measures must be enforceable.[51] This means that they must specify clear, unambiguous and measurable requirements.[52] The 5 suggested contingency measures all provide an economic incentive in form of a subsidy to encourage residents to switch from wood heat to an alternate less-polluting heat source to realize emission reductions. However, because the driver is economic and not regulatory, the emission reductions are not enforceable, which means they are not eligible as contingency measures.
2. Contingency measures must be fully adopted control measures that are ready to be implemented without significant further action by the State or EPA upon one of the four triggering events.[53] The 5 suggested contingency measures all rely on a subsidy which would require funding beyond that in DEC's existing budget. The Alaska Legislature has the power to appropriate state funds and would need to approve a budget that would include one or more of these subsidies. However, DEC does not control the Alaska Legislature nor its timeline for budget approvals over the course of various legislative

[50] https://www.regulations.gov/docket/EPA-R10-OAR-2022-0115/comments
[51] *See* 42 U.S.C. § 7410(a)(2)(A).
[52] Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements, Final Rule, August 24, 2016, 81 Fed. Reg. at p. 58046.
[53] *Id*. at 58056 and 58093.

sessions. Even if state funds were appropriated to one or more of these suggested subsidies, the whole apparatus to develop and implement a framework to equitably distribute such subsidies would take significant additional action by the State. Thus, due to funding and implementation issues, these suggested subsidies could not be implemented without significant further action by the State, which means they are not eligible as contingency measures.

7.11.3.3.8 Ammonia measures

One of the multiple reasons EPA disapproved of the contingency measures was that the measures would not achieve emission reductions of all plan precursors, including ammonia (NH_3).[54] In the same final action, EPA approved DEC's determination that there are no specific NH_3 emission controls for the major stationary or area sources or source categories in the baseline emission inventory and that certain measures designed to reduce direct $PM_{2.5}$ emissions also reduce NH_3 emissions.[55] As there are no available emission controls, DEC has included in section 7.11.5.3 an estimation of the collateral NH_3 emissions reductions associated with the adopted contingency measures.

7.11.4. Contingency Measures Adopted

The following section provides more information about each component of the proposed contingency measure package under the 2024 Amendment.

Under the 2024 Amendment, DEC developed a contingency measure package that will be implemented in the event that EPA issues any of the findings identified in 18 AAC 50.030(c).

In accordance with 40 C.F.R. § 51.1014, the package of additional controls that will serve as contingency measures for the 2024 Amendments consists of three components:

1. *Reduced Alert Levels* – increasing the stringency of the Stage 1 and Stage 2 alert levels under the Solid Fuel-Burning Appliance Curtailment Program from 20 $\mu g/m^3$ and 30 $\mu g/m^3$ to 15 $\mu g/m^3$ and 20 $\mu g/m^3$, which will result in more frequent application of burn restrictions;

2. *Enhanced Curtailment Program* – an enforceable commitment to increase staff hours that are devoted to compliance and enforcement activities for the wood heater curtailment program; and

3. *Enhanced Wood Device Removal* – an enforceable commitment to increase staff hours that are devoted to compliance and enforcement for SIP control measure STF-17 (Wood Device Removal).

[54] Air Plan Partial Approval and Partial Disapproval; AK, Fairbanks North Star Borough; 2006 24-Hour PM2.5 Serious Area and 189(d) Plan, Final Rule, December 5, 2023, 88 Fed. Reg. at p. 84663.
[55] *Id.* at 84636

7.11.4.1. Curtailment program alert levels and increased compliance

This component of the CM package will increase the stringency of the Stage 1 and Stage 2 alert levels under the Solid Fuel-Burning Appliance Curtailment Program from 20 µg/m^3 and 30 µg/m^3 to 15 µg/m^3 and 20 µg/m^3. This will result in more frequent application of burning restrictions under both stages, including Stage 2, which prohibits all solid fuel burning except in No Other Adequate Source of Heat (NOASH) households.

In addition, under the contingency measure DEC will mobilize additional staffing from within DEC to expand compliance and enforcement activities that are expected to result in an increased Curtailment Program compliance rate of 65%.

Compliance and enforcement activities are seasonal, these activities are performed October 1 through March 31 of each year. Due to the seasonality, DEC has determined that measuring staff hours spent on these activities is an appropriate parameter to indicate the level of resources DEC has dedicated to compliance and enforcement. Other parameters considered included Full Time Equivalents (FTEs), which were not selected because hours were a more descriptive parameter given the seasonality. The number of observed violations is currently tracked, however that parameter was not selected because the number of observed violations should drop as the compliance rate increases, so it is not a reliable indicator. The number of observed violations is also dependent on the meteorology and the number of alerts called per winter season. Compliance letters are also tracked but were not selected due to the same issues as the number of observed violations.

Currently, DEC allocates approximately 2,200 staff hours per winter season to curtailment compliance and enforcement. For perspective, one FTE during the winter season can contribute approximately 650 staff hours, so the current resources represent about 3.4 FTEs. For the contingency measure, DEC is claiming that compliance rates will increase from 38% to 65% due to dedicating additional staffing resources to compliance activities, which represents a 27 percentage point increase in compliance rate. DEC is not aware of any existing studies or information that could inform how much additional staffing is needed to increase the compliance rate by 27 percentage points. In the absence of existing studies or information, DEC is increasing from 2,200 staff hours per winter season to 2,800 staff hours per winter season to account for the increased compliance rate. For perspective, that is roughly equal to adding one FTE.

7.11.4.2 Enhanced wood device removal

The second component of the CM package consists of emission reductions through enhanced compliance with SIP control measure STF-17 under 18 AAC 50.077(*l*–n), which requires the surrender or removal of uncertified wood devices (including hydronic heaters) by December 31, 2024. DEC has modeled the effectiveness of this measure over time based on a 30% compliance rate by that 2024 date. In the event this contingency measure package is triggered, DEC projects that enhanced Curtailment Program stringency and enforcement will yield collateral, accelerated compliance with 18 AAC 50.077(*l*–n), increasing its effective compliance rate to 45%. This forecast is based on the expectation that the increase in called alerts with the decrease of their thresholds (to 15 µg/m^3 and 20 µg/m^3), coupled with enhanced staffing, increased compliance,

and other solid fuel device registration triggers (such as NOASH), will further disincentivize wood use and retention of wood-burning devices. DEC projects this will provide collateral emission reductions based an increase in compliance/penetration rate under 18 AAC 50.077(*l*–n) from 30% to 45% under this proposed CM package.

All historical compliance and enforcement efforts have been limited to real estate transactions because the date certain removal of December 31, 2024, has yet to be implemented. Present efforts rely substantially on self-reporting and referrals from the FNSB change out program, which is reflected in the current level of effort. Presently, DEC allocates approximately 150 staff hours per year for wood device removal compliance and enforcement. For this contingency measure, DEC is claiming that compliance rates will increase from 30% to 45% due to dedicating additional staffing resources to compliance activities, which represents a 15 percentage point increase in the compliance rate. The curtailment contingency measure in this package increased staffing by approximately 27% to achieve a 27 percentage point increase in complinace rate. If that same metric is applied in the wood device removal it would equate to only an additional 22.5 hours. DEC has determined that is not appropriate in this case because the measure has not yet been fully implemented, and so the current number of hours are not representative of full implementation. DEC anticipates that increased compliance with wood device removal will result from identification of potential violations. Identification of potential violations are expected to increase as DEC's registration dataset grows and it can be cross referenced with other datasets such as the change out program, assessors, and real estate. DEC expects some collateral benefits with the increase in curtailment compliance because that will drive the need for waivers, which require wood device registration. In addition to the collateral benefits from curtailment, DEC has determined that doubling the staff hours from 150 to 300 to cross reference datasets to identify violations will be sufficient to increase the compliance rate from 30% to 45%.

7.11.4.3. Enforceable Commitments

1. Within 60 days following the effective date of any of the determinations in 40 C.F.R. § 51.1014(a)(1)–(4) and 18 AAC 50.030(c)(1)(B) triggering contingency measures, DEC commits to increasing the staff hours for wood stove curtailment program (18 AAC 50.075(e) and (d); State Air Quality Control Plan Chapter II.III.D.7.12 Fairbanks Emergency Episode Plan) compliance and enforcement to at least 2,800 hours per winter season (October 1 through March 31). For the purposes of this commitment, the wood stove curtailment program compliance and enforcement includes, but is not limited to field observations, as well as administrative work, research, and peer review for advisory letters, compliance letters, and notices of violation.

a. DEC commits to maintaining at least 2,800 staff hours per winter until such time that the contingency measure can be relaxed through a formal SIP revision that complies with section 110(l) of the CAA.

b. DEC commits to publishing an annual report available to the public by May 31 of each calendar year. In the annual report DEC will include the staff hours for curtailment compliance and enforcement for the preceding winter season. In the annual report DEC will include a table of curtailment statistics similar to Table 7.9-4 in III.D.7.09 Attainment Demonstration with the

following parameters: observed violations, advisory letters issued, compliance letters issued, and notices of violation issued. The Air Quality Division Director or equivalent shall certify as to the truth and accuracy of the annual reports.

i. DEC's commitment is to maintain at least 2,800 staff hours per winter. The increase in staffing hours will lead to more observations, more advisory letters, more violations, and increased enforcement presence in the community. The cumulative effect will be behavioral changes within the community that lead to a higher compliance rate. Compliance rates for curtailment programs are inherently difficult to determine and not an appropriate parameter to base an enforceable commitment on. However, DEC has documented a method to monitor the curtailment program compliance rate on a per winter basis which is described in Appendix III.D.7.09. There is substantial benefit to maintaining the compliance rate observations as they can provide another benchmark for progress. DEC shall continue to conduct annual assessments of the compliance rate, as described in Appendix III.D.7.09, through the modeled attainment year of 2027 and shall report the results with the annual report published by May 31 of each calendar year. Should any of the determinations in 40 C.F.R. § 51.1014(a)(1)–(4) and 18 AAC 50.030(c)(1)(B) trigger the contingency measures DEC will continue to conduct the annual assessments of the compliance rate as described in Appendix III.D.7.09 and report the results with the annual report published by May 31 of each calendar year.

2. Within 60 days following the effective date of any of the determinations in 40 C.F.R. § 51.1014(a)(1)–(4) and 18 AAC 50.030(c)(1)(B) triggering contingency measures DEC commits to increasing the staff hours for wood device removal (18 AAC 50.077(*l* - n)) compliance and enforcement 300 hours per year. For purposes of this commitment, the wood device removal compliance and enforcement includes but is not limited to processing wood device registration, identifying potential violations, cross-referencing wood device data sets, administrative work, research, and peer review for advisory letters, compliance letters, and notices of violation.

a. DEC commits to maintaining this increased staffing level until such time that the contingency measure can be relaxed through a formal SIP revision that complies with section 110(l) of the CAA.

b. DEC commits to publishing an annual report available to the public by May 31 of each calendar year. In the annual report DEC will include the staffing hours for wood device removal compliance and enforcement for the preceding year. In the annual report DEC will include a table of wood device removal statistics with the following parameters: wood device registrations processed, advisory letters issued, compliance letters issued, and notices of violation issued. In the annual report DEC will include a summary of wood devices removed derived from FNSB change out program data. The Air Quality Division Director or equivalent shall certify as to the truth and accuracy of the annual reports.

7.11.4.4. Process for Identifying New Contingency Measures

The FNSB and DEC continue to seek additional measures that may be developed and considered for implementation in the coming years. Working with the local community and elected officials, the agencies will evaluate additional measures that can be integrated into the air quality planning process and included in future revisions to the area's air quality State Implementation Plan.

The four triggers for contingency measures in 40 CFR § 51.1014(a)(1)–(4) and 18 AAC 50.030(c) are failure:

1. To meet any RFP requirement in an attainment plan,
2. To meet any quantitative milestone in an attainment plan,
3. To submit a quantitative milestone report, or,
4. To attain the applicable $PM_{2.5}$ NAAQS by the applicable attainment date.

Independent of contingency measure triggers, CAA section 189(c)(3) also requires a plan revision upon failure of items 1-3 above, and CAA section 189(d) requires a plan revision upon failure of item 4 above. Therefore, independent of triggering contingency measures, those same four events also trigger plan revision requirements under federal statute. Further, CAA section 172(c)(9) requires those plan revisions to include contingency measures. Thus, if this contingency measure package is triggered, then DEC would have no prospective contingency measures and would need to include new contingency measures in subsequent and required plan revisions.

7.11.5 Emission Reductions

The following section contains an analysis of their combined emission reductions and a comparison to the OYW attainment targets recommended under EPA's draft 2023 guidance. While this chapter presents emission reductions compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

EPA published draft guidance[56,57] in March 2023 for contingency measure (CM) requirements in ozone and particulate matter nonattainment areas. Longstanding EPA policy preceding this 2023 draft guidance recommended that CMs provide emission reductions equal to or exceeding one year's worth (OYW) of RFP (based on the linear RFP trajectory). The 2023 draft guidance continues to recommend an annual progress-based approach but revises the metric to OYW reductions relative to attainment, rather than RFP, at the time CMs would be triggered. Thus, this subsection provides a comparison of CM reductions to the new metric, OYW of attainment, contained in the 2023 draft guidance. While this chapter presents emission reduction compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

[56] https://www.epa.gov/air-quality-implementation-plans/draft-contingency-measures-guidance
[57] 88 Fed. Reg. 17571 (March 23, 2023).

7.11.5.1 Calculation of PM2.5 emission benefits from proposed contingency measures and comparison to OYW of progress

Emission benefits from enhanced stringency and staffing-based increases in compliance from these two components under the contingency measure package for the 2024 Amendment were estimated for calendar year 2028 (one year after forecasted attainment in 2027).

As noted above, both control components work to suppress/remove wood device usage for space heating. Consistent with development of the 2024 Amendment Control inventories, this is expected to result in heating energy from suppressed or removed wood devices to be replaced by that from heating oil devices (the most common space heating devices in the Nonattainment Area). Thus, as was performed in the Control inventories, emissions impacts of the contingency measure package were calculated for both direct $PM_{2.5}$ and SO_2 using the same methodologies as follows.

The CM package would be triggered by a finding under 40 C.F.R. § 51.1014(a)(1)–(4) with the most probable trigger being a finding of failure to attain the standard by the modeled December 31, 2027, attainment date. Assuming a finding of failure to attain, the 2027 Control inventory was the "starting point" inventory upon which the contingency measure emission reductions were calculated. The assessment based on the 2027 control inventory is representative of the emissions reductions achieved if the contingency measures are triggered before the modeled December 31, 2027, attainment date.

Basic Emission Reductions – For the Enhanced Curtailment Program, DEC evaluated a range of both alert stage stringency levels (down to 12 $\mu g/m^3$) and compliance rates up to 90% (the rate estimated by the San Joaquin Valley for their curtailment program). The effects of the alert stage stringencies were modeled based on how many days within the 74-day modeling episode would trigger Stage 1 and Stage 2 alerts. DEC also considered the potential impacts of setting the alert levels so low that they would occur so frequently in the winter that they might adversely impact the compliance rate. As a result, DEC established alert levels of to 15 $\mu g/m^3$ for Stage 1 and 20 $\mu g/m^3$ for Stage 2. DEC will also mobilize additional staffing from within the DEC Air Quality Division during wintertime to provide expanded compliance monitoring and enforcement, which is expected to increase the compliance rate to 65%. Based on these alert stage stringency and compliance rate increases, the Enhanced Curtailment Program (applied as a contingency measure after 2027) is expected to yield an additional 0.090 tons/episode day reduction in $PM_{2.5}$ and an increase in SO_2 emissions of 0.038 tons/episode day. (The SO_2 increase results from displaced wood heating energy shifting to heating oil.)

As noted earlier, "collateral" benefits of the Enhanced Curtailment Program are expected to produce an increase in compliance/penetration with DEC's Wood Device Removal measure, increasing the compliance rate from 30% to 45% in 2027/2028. As a result of this increase in compliance, the Enhanced Wood Device Removal measure will result in additional reductions of 0.062 tons/episode day of $PM_{2.5}$, with a less than 0.0005 tons/episode day increase in SO_2.

Table 7.11-3 summarizes the $PM_{2.5}$ and SO_2 emission reductions for DEC's contingency measure package. (Emission increases are negative reductions shown in red.) Reductions are shown for each component (Enhanced 2-Stage Curtailment Program and Enhanced Wood Device Removal), with the total reductions below. The last (green highlighted) row in Table 7.11-3 shows net emission reductions from the combined contingency measure package after accounting for overlapping effects between both components. These highlighted reductions were then compared to OYW attainment emission reduction targets as explained below. While this chapter presents emission reduction compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.

Table 7.11-3
Basic Contingency Measure Emission Reductions

Contingency Measure Component	Emission Reductions (tons/episode day)	
	$PM_{2.5}$	SO_2
Enhanced 2-Stage Curtailment	0.089	-0.038
Enhanced Wood Device Removal	0.062	-0.000
Total Contingency Measure Package	**0.151**	**-0.038**
Total Package Discounted for Overlap	**0.142**	**-0.038**

7.11.5.2. Calculation of only changing alert levels

DEC conducted an analysis of the control measures to determine the amount of emission reductions that are due to the discrete act of lowering the alert thresholds within the curtailment program. Using monitoring data from the 2019-2020 episode the number of days, within the 74 day episode, that fall under each alert level are shown in Table 7.11-4. As expected, lowering the alert levels results in more total Stage 1 and Stage 2 alert days.

Table 7.11-4
Comparison of Expected Alert Days with Lower Alert Levels

		Ep Days		Ep Days
< 15 µg/m3	Stage 0:	29	< 20 µg/m3	49
> 15 µg/m3	Stage 1:	7	> 20 µg/m3	17
> 20 µg/m3	Stage 2:	38	> 30 µg/m3	8

Relative reductions were estimated for all stages of the curtailment program with a constant 38% compliance rate. Table 7.11-5 shows a comparison of 2028 episodic emissions by source category at three levels of control as follows:

1) pre-curtailment (before application of curtailment program reductions);
2) with curtailment at current alert levels of 20/30 $\mu g/m^3$; and
3) with curtailment at lower alert levels of 15/20 $\mu g/m^3$.

Emissions at all levels reflect a constant 38% compliance rate.

The emissions in the Current Alerts and Lower Alerts columns of Table 7.11-5 are calculated based on the distribution of alert days in Table 7.11-4 (where Stage 0 is no alert) and the applicable relative reductions.

Total emissions across all space heating source categories under each control level are provided at the bottom of Table 7.11-5.

Incremental emission reductions are then presented in Table 7.11-6. The reductions of 0.086 tons/day for $PM_{2.5}$ and -0.047 tons/day for SO_2 were calculated by taking the difference in total emissions reported at the botttom of Table 7.11-5 between the current and lower alert levels. (For example for $PM_{2.5}$, 0.630 – 0.544 = 0.086 tons/day.) The combined IPT reduction of 0.077 tons/day is then compared to both the OYW target and the total CM package reductions on a percentage basis. As shown in Table 7.11-6, this reduction to 15 $\mu g/m^3$ and 20 $\mu g/m^3$alert levels (from the current 20 $\mu g/m^3$ and 30 $\mu g/m^3$alert levels) represents 62% of the OYW target and 58% of the total CM package reductions.

(While this chapter presents emission reduction compared to the 2023 draft contingency measure guidance, OYW of RFP is presented in Chapter III.D.7.10 for comparison to the emission reductions if needed.)

Table 7.11-5
2028 Emissions (tons/day) Before and After Lowering Alert Levels

2028 Emissions (tons/day)							
		Pre-Curtailment		Current Alerts 20/30 ug/m^3		Lower Alerts 15/20 ug/m^3	
Source Category	SCC	$PM_{2.5}$	SO_2	$PM_{2.5}$	SO_2	$PM_{2.5}$	SO_2
FP	2104008100	0.242	0.006	0.232	0.006	0.195	0.006
Ins-Conv	2104008210	0.008	0.000	0.007	0.000	0.006	0.000
Ins-NonCat	2104008220	0.020	0.001	0.019	0.002	0.016	0.003
Ins-Cat	2104008230	0.029	0.002	0.027	0.003	0.023	0.005
WS-Conv	2104008310	0.026	0.002	0.022	0.003	0.020	0.004
WS-NonCat	2104008320	0.110	0.011	0.101	0.018	0.087	0.028
WS-Cat	2104008330	0.170	0.017	0.156	0.027	0.135	0.042
PS-Exempt	2104008410	0.002	0.000	0.001	0.001	0.001	0.001
PS-EPACert	2104008420	0.015	0.003	0.013	0.008	0.012	0.011
OWBWtd	2104008610	0.016	0.002	0.014	0.002	0.012	0.003
COil-Res/Prtbl/DV	2104004000	0.013	1.527	0.013	1.527	0.013	1.527
COil-Com	2103004001	0.008	0.393	0.008	0.393	0.008	0.393
NtGas-Res	2104006010	0.000	0.000	0.000	0.000	0.000	0.000
NtGas-Com	2103006000	0.014	0.001	0.014	0.001	0.014	0.001
CoalHt	2104002000	0.000	0.001	0.000	0.001	0.000	0.001
Coal-Com	2103002000	0.000	0.000	0.000	0.000	0.000	0.000
Wood-Com	2103008000	0.000	0.000	0.000	0.000	0.000	0.000
WasteOil	2102012000	0.003	0.019	0.002	0.035	0.002	0.048
Emission Totals (tons/day):		**0.676**	**1.986**	**0.630**	**2.027**	**0.544**	**2.073**

Table 7.11-6
2028 Emissions (tons/day) Before and After Lowering Alert Levels

2028 Incremental Emission Reductions (tons/day)		
$PM_{2.5}$	SO_2	Total IPT
0.086	**-0.047**	**0.077**
	IPT Target:	**0.125**
	Relative Fraction of IPT Target:	**62%**
	Total CM Package Reduction (w/IPT):	**0.134**
	Relative Fraction of CM Package:	**58%**

The detailed contingency measure emission reduction calculations are contained in the "2024Amendment_ControlMeasureBenefits_DftFinal.xlsx" spreadsheet which is part of the electronic materials included with Appendix 7.06. The ReadMe tab in the spreadsheet explains where the contingency measure calculations are contained.

7.11.5.3 Calculation of ammonia benefits from proposed contingency measures

Ammonia (NH_3) Emission Reductions – As explained earlier in Sections III.D.7.6 and III.D.7.10, control measure emission reductions were quantified for directly-emitted $PM_{2.5}$ and SO_2. They were not rigorously calculated for ammonia due to large uncertainty in NH_3 emission factors for key sources. With that caveat, an estimate of NH_3 emission reductions for the contingency measure package was also developed to quantify those reductions expected from the package. The estimated NH_3 reductions were based on differences in residential wood and heating oil emission factors and the shift from wood to oil use reflected under the Curtailment Program as explained below.

Table 7.11-7 lists 2028 Projected Baseline episodic energy use along with both direct $PM_{2.5}$ and NH_3 emission factors in units of lb/mmBTU for relevant sources categories within the space heating sector. The 2028 episodic energy use estimates and emission factors are contained in the "DevSumOut-2028BSR" tab of the "2024Amendment_ControlMeasureBenefits_DftFnl.xlsx" spreadsheet appendix to Section III.D.7.6. (The emission factors were converted from lb/ton or lb/gallon units to lb/mmBTU based on wood and heating oil energy contents described in Appendix III.D.7.6.)

Table 7.11-7
2028 Episodic Energy Use and Emission Factors for
Scaling Contingency Measure Package NH_3 Reductions

Source Category	Episodic Energy Use (mmBTU/day)	Emission Factors (lb/mmBTU)	
		$PM_{2.5}$	**NH_3**
Fireplace	841	2.150	0.112
Insert, Non-certified	32	1.902	0.106
Insert, Certified, Non-Catalytic	121	0.746	0.056
Insert, Certified, Catalytic	176	0.808	0.056
Woodstove, Non-certified	260	0.755	0.025
Woodstove, Certified, Non-Catalytic	990	0.493	0.016
Woodstove, Certified, Catalytic	1,438	0.547	0.016
Pellet Stove, Exempt	40	0.193	0.005
Pellet Stove, Certified	375	0.193	0.005
Hydronic Heater	200	0.613	0.015
All Wood, Weighted Composite	**4,473**	**0.844**	**0.036**
Residential Oil, Weighted Composite	**31,132**	**0.00341**	**0.00018**
Ratio of Oil to Wood Emission Factors		**0.00404**	**0.00502**

The first two boldface rows near the bottom of Table 7.11-7 present composite emission factors for all residential wood and residential oil use that are weighted by episodic energy use across each individual source category. (The individual source categories for residential oil: central oil, direct vent, and portable heaters are not listed in Table 7.11-7 since they have the same $PM_{2.5}$ and NH_3 emission factors.) As shown in Table 7.11-7, composite $PM_{2.5}$ emission factors are

0.844 lb/mmBTU and 0.00341 lb/mmBTU for wood and heating oil, respectively. Similarly, composite NH_3 emission factors are 0.036 lb/MMBTU for wood and 0.00018 lb/mmBTU for heating oil.

Below these composite emission factors, Table 7.11-7 provides the calculated ratios of Oil to Wood emission factors for each pollutant. For example, the $PM_{2.5}$ Oil to Wood ratio was calculated as follows:

Oil-To-Wood Ratio, $PM_{2.5}$ = 0.00341 ÷ 0.844 = 0.00404

As seen at the bottom of Table 7.11-7, the NH_3 ratio of 0.00502 is similar to that for $PM_{2.5}$.

These ratios were then used to calculate scaled NH_3 emission reductions from the contingency measure package that reflects enhancements to the Curtailment Program as explained earlier in this section. These calculations and resulting NH_3 emission reductions are presented below in Table 7.11-8.

Table 7.11-8
Contingency Measure Package NH_3 Reductions (tons/episode day)

Parameter	$PM_{2.5}$	NH_3
2028 Projected Baseline Space Heating Emissions (tons/episode day)	1.972	0.124
Contingency Measure Package $PM_{2.5}$ Reductions* (tons/episode day)	5	n/a
Scaled CM Package NH3 Reductions (tons/episode day)	n/a	**0.007**

* Reflects non-overlapping benefits
n/a – Not applicable

The top row of Table 7.11-8 lists 2028 projected baseline nonattainment area space heating emissions of $PM_{2.5}$ and NH_3 also contained in the "DevSumOut-2028BSR" tab of the "2024 Amendment_ControlMeasureBenefits_DftFnl.xlsx" spreadsheet appendix to Section III.D.7.6. Below that, the non-overlapping $PM_{2.5}$ reductions calculated for the contingency measure package of 0.142 tons/episode day shown earlier in Table 7.11-3 were used in conjunction with the projected baseline emissions to estimate commensurate NH_3 emission reductions of 0.007 tons/episode day shown at the bottom of Table 7.11-8. These NH_3 reductions were scaled based on the differences in baseline emissions between $PM_{2.5}$ and NH_3, the relative reduction in $PM_{2.5}$, and the Oil to Wood emission factor ratios computed earlier in Table 7.11-7 as follows.

$$\text{CM Package NH3 Reductions} = 0.124 \times \frac{0.14}{1.972} \times \frac{0.00404}{0.00502} = 0.007 \text{ tons/episode day}$$

Thus, it was estimated that the contingency measure package will also provide NH_3 emission reductions of 0.007 tons/episode day.

7.11.6. Legal Sufficiency of Commitments

DEC's contingency measure commitments are legally permissible and sufficiently enforceable.

The CAA allows approval of enforceable commitments that are limited in scope where circumstances warrant using such commitments in place of adopted measures. Once EPA determines that circumstances warrant consideration of an enforceable commitment, EPA considers three factors in determining whether to approve the CAA requirement that relies on the enforceable commitment:

(1) whether the commitment addresses a limited portion of the CAA requirement;
(2) whether the state is capable of fulfilling its commitment; and
(3) whether the commitment is for a reasonable and appropriate period of time.[58]

The Ninth Circuit, among others, has also analyzed whether the CAA permits state implementation plans to rely on enforceable commitments. The Ninth Circuit has determined that enforceable commitments can meet the requirement in CAA Section 110(a)(2)(A) for the SIP to include "other control measures, means, or techniques . . . as well as timetables for compliance." Enforceable commitments that meet these SIP requirements also meet the definition of "emission standard or limitation" in CAA Section 304(f) (CAA citizen suit provision). Thus, if a state does not fulfill its commitment, the public can seek a remedy pursuant to CAA Section 304. The Ninth Circuit evaluates the following factors in determining whether an enforceable commitment is a permissible component of a SIP control strategy under CAA Section 110(a)(2)(A), and meets the definition of emission standard or limitation under CAA Section 304(f):

(1) whether the commitment is written as enforceable and not simply an aspirational, unenforceable goal, and
(2) whether the commitment is enforceable as a practical matter, with enough public information for the public to enforce the state's compliance with its commitment.[59]

DEC's contingency measure package in this chapter includes a lowering of the curtailment threshold that would be automatically triggered, as well as two enforceable commitments: increasing staff hours for curtailment compliance and enforcement and increasing staff hours for wood device removal. Both commitments are both permissible and enforceable under the applicable analyses.

a. <u>DEC's commitments are legally permissible.</u>

As to the three-part test, first, the commitments address a limited portion of the statutorily required program. When the commitment is part of the control strategy designed to achieve attainment, EPA has historically accepted commitments that account for no more than 10% of the necessary emissions reductions. This is not a statutory or regulatory requirement, however. As such, EPA has on occasion approved commitments that account for more than 10% of the emissions reductions necessary to achieve attainment. In the contingency measure context, EPA has interpreted the CAA as requiring that the contingency measure achieve OYW of RFP unless

[58] *Med. Advocs. for Healthy Air v. EPA*, No. 20-72780, 2022 WL 1109656, at *2 (9th Cir. Apr. 13, 2022) (unreported); *BCCA Appeal Grp. v. EPA*, 355 F.3d 817, 840 (5th Cir. 2003).
[59] *Comm. for a Better Arvin v. EPA*, 786 F.3d 1169, 1181 (9th Cir. 2015).

the state provides a reasoned justification for why some lesser amount is acceptable. In draft guidance, EPA provided a OYW of progress as an alternative metric for contingency measures. Here, reducing the curtailment alert levels (the automatically triggered, non-commitment portion of this contingency measure package) leads to $PM_{2.5}$ reductions of 0.77 tons/day (with inter-pollutant trading, discussed below) that are 62% of the OYW target and 58% of total contingency measure package reductions. This means that the two enforceable commitments combined (increased staff hours for curtailment plus wood device removal) represent a minority, i.e., a limited portion, of statutorily required contingency measures.[60]

Second, the state is capable of fulfilling its commitments. In *BCCA Appeal Group*, this factor was met because Texas provided EPA with sufficient information to assure EPA it was capable of adopting controls to achieve the necessary level of emission reductions. 355 F.3d at 841. In *Medical Advocates for Healthy Air*, this factor was *not* met because California, by its own calculations, had a potential $2.6 billion shortfall in funding for its incentive-based control measure commitments. 2022 WL 1109656, at *2. Here, DEC would move staff hours within its existing, assured Air Quality Division budget. Unlike California in *Medical Advocates for Healthy Air*, DEC has no budget shortfall; it has the capacity to adopt these staffing contingency measures and maintain them indefinitely.

Third, the commitments are for a reasonable and appropriate period of time. Prior case law addresses commitments for emissions reductions as part of total control strategies, not contingency measures, and so they are inapposite. Here, under current and draft future guidance for contingency measures, they should take effect within 60 days and should achieve emission reductions within one year (and two years at the maximum).[61] As discussed above, DEC commits to maintain increased staffing levels for both curtailment and wood device commitments until such time that the contingency measure can be relaxed through a formal SIP revision that complies with section 110(l) of the CAA. In other words, DEC commits to maintaining the increasing staffing indefinitely, barring an EPA-approved SIP revision.

As such, DEC's enforceable commitments meet the three-factor legal test applied in *Med. Advocs. for Healthy Air v. EPA* (9th Cir. 2022) (unreported) and *BCCA Appeal Grp. v. EPA* (5th Cir. 2003).

b. <u>DEC's commitments are sufficiently enforceable.</u>

DEC's commitments meet the generalized two-part analysis in *Comm. for a Better Arvin v. EPA* (9th Cir. 2015), to ensure that control measures can be enforced by individuals and the EPA. 786 F.3d at 1175. In *Better Arvin*, petitioners argued that California's commitments were merely unenforceable aspirational goals and contained no specific strategies or measures. Alternatively, petitioners argued that even if the commitments were not merely aspirational goals, they were

[60] Note that this legal test was made for nonattainment areas whose control strategies could not account for all needed emission reductions, and who therefore needed to make enforceable future commitments. Here, DEC's control strategy accounts for all needed emission reductions, and its enforceable commitments are reserved for a portion of its contingency measures.

[61] EPA, *DRAFT: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter* (March 17, 2023), at 40–41.

still unenforceable because California could change them, and it was practically impossible to bring a timely enforcement action. 786 F.3d at 1179.

First, DEC's commitments are enforceable and not merely aspirational. In *Better Arvin*, the court decided that California's commitments were not merely aspirational because they used mandatory and nondiscretionary language to commit to adopting and implementing measures that will achieve specific emissions reductions by specific years, and because they required action within the state agency's control. 786 F. 3d at 1179–1180; *see also Physicians for Soc. Resp.-Los Angeles v. EPA*, 607 F. App'x 718, 719 (9th Cir. 2015) (unreported). Both of DEC's enforceable commitments meet these standards. For curtailment compliance and enforcement, DEC commits to increasing the staff hours for curtailment compliance and enforcement from 2,200 hours per winter to 2,800 hours per winter within 60 days of any finding that triggers the contingency measure. For wood device removal, DEC commits to increasing the staff hours for wood device removal compliance and enforcement from 150 hours per year to 300 hours per year within 60 days of any finding that triggers the contingency measure. These are mandatory, nondiscretionary, and measurable contingency measures that require action within DEC's control.

Second, DEC's commitments are enforceable in a practical sense. In *Better Arvin*, the court decided that California's commitments were enforceable because its emission reduction commitments were binding on the state through its EPA-approved SIP, and its procedures for adopting emission control measures and achieving emission reductions all included publicly available information for determining compliance. 786 F.3d at 1181; *see also Ass'n of Irritated Residents v. EPA*, 10 F.4th 937, 947 (9th Cir. 2021). DEC's commitments meet these standards, as well. Both commitments will be binding on the state through this SIP, once approved by EPA. And both commitments, set out above, include aspects of making information public for the public and EPA to assess DEC's compliance with its commitments.

As such, DEC's contingency measure commitments meet the analysis in *Better Arvin* (9th Cir. 2015) for sufficiently enforceable control measure commitments.