

From: [Speight, Angela](#)
To: [Dec Air Comment](#)
Cc: [Brune, Jason W \(DEC\)](#); [Edwards, Alice L S \(DEC\)](#); [Heil, Cynthia L \(DEC\)](#); [Chapados, Doug](#); [Glenn, Richard](#)
Subject: Petro Star Public Comment - FNSB PM 2.5 Serious SIP
Date: Friday, July 26, 2019 9:28:38 AM
Attachments: [July 11_email_ADEC_PM_2.5.pdf](#)
[July 3_email_ADEC_PM_2.5.pdf](#)
[July 19_email_ADEC_PM_2.5.pdf](#)
[July 12_email_ADEC_PM_2.5.pdf](#)
[ADEC_BACM_#2To#1_Oil_CostEffectiveness_Calcs_With_Additional_PSI_Tab.xlsx](#)
[BACM_#2To#1_Oil_CostEffectiveness_Calcs.xlsx](#)
[5PctProgress_#2To#1_Oil_Calcs.xlsx](#)
[PSI_Testimony_6.26.19.pdf](#)
[Petro_Star_Emission_Calculations_&_Cost_Impacts_7319.xlsx](#)
[#1_&_#2_Heating_Oil_Lower_Heating_Value_Calculations.pdf](#)
[PSI_Fact_Sheet_Refinery_Projects_1-22-2018_v2.pdf](#)
[PM_2.5_Public_Comment_FINAL_7-26-2019.pdf](#)

Attached please find Petro Star's public comment for filing. If you have any questions, or would like any further information, please feel free to call. Thank you for your attention to this issue and we look forward to working with ADEC as the public comments are addressed.

Have a lovely weekend ---

Angela

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July 26, 2019

Alaska Department of Environmental Conservation
Division of Air Quality
Attn: Cindy Heil
555 Cordova St.
Anchorage, Alaska 99501
Via email: dec.air.comment@alaska.gov

Re: Petro Star's Opposition to Best Available Control Measure #51 prohibiting the sale of #2 Heating Oil beginning July 1, 2010

To whom it may concern:

Petro Star Inc. (Petro Star) is the only Alaska-owned refiner in the State of Alaska, and the only producer of #2 Heating Oil in Alaska, the subject of the Serious State Implementation Plan (SIP) prohibition in Best Available Control Measure (BACM) #51. Petro Star is deeply concerned because this control measure proposes to ***tell Interior residents what they can and can't burn for home heating oil – something ADEC has scrupulously avoided for other means of space heating.*** This prohibition on #2 Heating Oil would result in a ***slight increase to PM 2.5 emissions, while adding \$4-8 million dollars per year for the foreseeable future to the community's existing energy burden,*** all of this according to calculations produced by and for the Alaska Department of Environmental Conservation (ADEC).¹

BACM #51 will impair Petro Star and other heating oil distributors' ability to provide their customers locally produced #2 Heating Oil, a fuel that does not significantly contribute to the existing PM 2.5 non-attainment issue.² According to the Serious SIP Planning Inventory calculations, heating oil is the second ***smallest*** source of PM 2.5 within the nonattainment area, contributing a small fraction of the PM 2.5 emitted through solid fuel burning, despite being the predominant means of heating Interior homes and businesses. ADEC's motivation for proposing BACM #51 lays in the belief that a switch to #1 Heating Oil will "provide a significant reduction in SO2 emissions equivalent to roughly three years of progress towards" the 5 percent plan that will follow the Serious SIP.³ Petro Star is disturbed that ***this manipulation of the modeling data to focus singularly on sulfur emissions, at the expense of Interior heating oil consumers, will only kick the can down the road another 3 years before seriously addressing the PM 2.5 issue.***

During the public comment period, Petro Star has actively engaged with the ADEC Air Quality Division in an effort to provide empirical data and information regarding heating oil consumption, heating values and

¹ See email dated July 12, 2019 from Cindy Heil to Angela Speight and attached spreadsheet "BACM #2 to #1 Oil Cost Effectiveness Calcs" detailing that PM 2.5 emissions will increase 1.096 tons/year in 2019 due to BACM #51 at a cost increase of \$4,053,317 annually.

² See Serious SIP Public Notice Draft, Table 7.6-12 demonstrating that Area, Space Heat, Oil Planning Inventory for PM 2.5 emissions equal 0.08; the only lower PM 2.5 emission is Area, Space Heat, Other at 0.01.

³ See email dated July 12, 2019 from Cindy Heil to Angela Speight and attached spreadsheet "5 Pct Progress #2 to #1 Oil Calcs" detailing that the SO2 emission reductions are estimated to be 15.6% while the reductions in PM 2.5 are only estimated to be 0.3%. It should be noted that this small reduction in PM 2.5 is completely offset by increased wood burning in response to higher heating oil costs.

sulfur content, and pricing information by fuel grade, all of which is critical to producing an accurate analysis and calculating estimated emission and cost impacts. The descriptions below are intended to provide a summary of the errors identified in the modeling data that serves as the basis for the Serious SIP, with the hope that ADEC will correct the data and modify its BACM recommendations accordingly. Further, and as requested by ADEC, Petro Star has attached the numerous emails, spreadsheets, specifications and other documents provided during the public comment period:

Flawed Economic Analysis

Petro Star is concerned that the economic analysis provided as part of the Serious SIP – and used to present the impact as “only \$70 annually per household”⁴ – is fatally flawed. EPA’s feedback to the preliminary SIP documents stressed the importance of a supply side analysis and analyzing the total cost in terms of standard BACM metrics, or \$/ton.⁵ Instead of a fulsome discussion of the cost per ton, as directed by EPA, the analysis has chosen to ignore the supply side costs and analyze BACM #51 in terms of the annual cost per household, a calculation that is riddled with errors.

The Serious SIP does not incorporate EPA’s comments in its economic analysis, but rather assumes an unlimited, local supply of #1 Heating Oil available at a static price point. During its discussions and review of materials provided by ADEC, Petro Star has identified three key flaws in the financial impact analysis:

- Failure to use consistent “Annual Daily Energy Use (mmBTU/day)” values in estimating pollutant emission reductions and cost impacts;
- Failure to use consistent and accurate heat content values for both grades of heating oil in its calculations; and
- Failure to factor in transportation costs for fuel imports to the Interior as demand exceeds local supply.⁶

Correcting the financial impact analysis for those three key errors increases the cost per ton of sulfur emission reduction from the original estimate of \$9,692 to \$40,243, and **the potential impact to households burning #2 Heating Oil increases to over \$600 annually, 8.5 times the estimated impact publicly touted by ADEC.** By comparison, ADEC’s calculated impact of switching to ULSD (\$311.96 to \$374.86 annually) was eliminated from further consideration as economically infeasible.⁷ Choosing to emphasize the lowest possible number⁸ violates ADEC’s own admonitions to use the most conservative values, and fails to meet EPA’s directive to provide a transparent and detailed economic analysis.

⁴ ADEC Commissioner Jason Brune, at the Fairbanks Chamber of Commerce Luncheon on May 14, 2019, stating that the financial impact of a change from #2 to #1 Heating Oil would be “only \$70 annually per household.” See also Notice of Proposed Changes, Additional Regulation Notice Information part 7 under impacts to private persons.

⁵ See EPA comments on ADEC Preliminary Draft Serious SIP Development materials for the Fairbanks serious PM 2.5 nonattainment area, BACM – Ultra-low sulfur fuel.

⁶ See email dated July 19, 2019 from Angela Speight to Cindy Heil after review of the calculations provided in the email dated July 12, 2019 from Cindy Heil to Angela Speight.

⁷ See Residential Fuel Expenditure Assessment of a Transition to Ultra-Low Sulfur and High Sulfur No. 1 Heating Oil for the Fairbanks PM-2.5 Serious Nonattainment Area, February 2019.

⁸ See Residential Fuel Expenditure Assessment of a Transition to Ultra-Low Sulfur and High Sulfur No. 1 Heating Oil for the Fairbanks PM-2.5 Serious Nonattainment Area, February 2019 detailing that a price differential of 7 cpg results in 50% of households increasing \$68.31, while the Monte Carlo estimates show an increase ranging from \$68.31 to \$84.32, pages viii-ix. Assuming the \$70 estimate is correct, that would spread the impact across over 57,000 households in the nonattainment area (\$4 million divided by \$70 equals 57,143 households impacted). By contrast, the US Census Bureau details that there are 36,396 household units in Fairbanks as of July 1, 2018 per <https://www.census.gov/quickfacts/fact/table/fairbanksnorthstarboroughalaska/HSG010218#HSG010218> only a fraction of which burn #2 Heating Oil.

ADEC Calculations w/Correction Impacts	Annual Economic Burden On the Community - \$/Year	SO2 Emission Reduction - Tons/Year	PM 2.5 Emission Increase - Tons/Year	Control Measure Efficiency - \$/ton of SO2 Removed	Annual Economic Impact per #2 Heating Oil Household - \$/Year
ADEC Original Calcs	\$4,053,317	418.23	1.096	\$9,691.54	~\$70
Consistent Energy Use	\$4,053,317	198.89	0.583	\$20,379.79	\$311.71
Correct Heat Contents	\$6,202,416	198.89	0.583	\$31,185.31	\$476.98
Transportation Adjustment	\$8,003,825	198.89	0.583	\$40,242.67	\$615.51

Inconsistent Energy Use Calculations

ADEC’s #2 to #1 Heating Oil impact analysis uses two different sets of “Annual Daily Energy Use (mmBTU/day)” values when calculating the cost and pollutant emission impacts of a #2 to #1 Heating Oil conversion. When calculating cost impacts, ADEC assumes a combined daily energy use from heating oil and wood burning of 13,941mmBTU/day, however, when calculating emissions it assumes an average daily energy use of 28,887mmBTU/day (more than double).⁹ ***Using two different values in these calculations either understates #2 to #1 Heating Oil conversion costs, or overstates pollutant emission reductions, effectively lowering the cost per ton of pollutant removed.*** Using the appropriate daily energy use value (13,941mmBTU/day) in both calculations lowers the sulfur emissions reduction from ADEC’s estimate of 418.2 tons/year to 198.9 tons/year. This reduction in sulfur emissions closely matches Petro Star’s estimate of 190.2 tons/year based on North Pole Refinery production data provided to ADEC.¹⁰ While this correction does not increase estimated conversion costs, it does increase the cost per ton of pollutant removed to \$20,380 from ADEC’s original estimate of \$9,692. The significant cost of BACM #51, even adjusted for this inconsistency, still results in a slight increase to PM 2.5 emissions, an outcome directly contrary to the stated goal of the Serious SIP.

Inaccurate Heat Content Values

Petro Star demonstrated to ADEC that the heat content values used to support the BACM #51 financial analysis were inconsistently applied throughout the calculations.¹¹ Upon reviewing the spreadsheets ADEC provided, Petro Star identified multiple sets of heat content values drawn from a wide range of sources, however, in the critical analysis of the costs for a conversion from #2 Heating Oil to #1 Heating Oil (where the cost impacts were calculated), an entirely different set of heat content values were used, minimizing the heat content differential between the two fuel grades.¹² Correcting ADEC’s calculation to use accurate heat content values¹³ increases the cost impact to the Interior from \$4.05 million to \$6.2 million annually, and increases the cost per ton of pollutant removed to \$31,185 from ADEC’s original estimate of \$9,692.

⁹ See email dated July 12, 2019 from Cindy Heil to Angela Speight and attached spreadsheet “BACM #2 to #1 Oil Cost Effectiveness Calcs” under Tabs EFs-BTU and 2 to 1, specifically Cells E190 and E89. The heat content value used to estimate pollutant emission reductions is 107% greater than the equivalent value used to estimate cost impacts. To produce an accurate analysis, the same set of heat content values should be used in both the pollutant reduction and cost calculations.

¹⁰ See email dated July 3, 2019 from Angela Speight to Cindy Heil, and attached spreadsheet with Petro Star Emission Calculations, under Fuel Emission tab, specifically Cell H20.

¹¹ See email dated July 19, 2019 from Angela Speight to Cindy Heil regarding discussion topics for a call with ADEC Air Quality Division and its consultants.

¹² See email dated July 12, 2019 from Cindy Heil to Angela Speight and attached spreadsheet “BACM #2 to #1 Oil Cost Effectiveness Calcs” under Tabs EFs-BTU and 2 to 1.

¹³ See email dated July 3, 2019 from Angela Speight to Cindy Heil, and attachments with #2 & #1 Heating Oil Lower Heating Value Calculations, as discussed with ADEC on July 19, 2019.

No Consideration of Supply and Transportation Costs

Given that jet fuel and #1 Heating Oil are essentially the same material, competition between Interior residential heating oil consumers and military jet fuel requirements will grow substantially as the new F-35 squadrons come online and Eielson AFB demand increases. Nowhere can Petro Star find where this major supply-side change was taken into consideration when the financial impact analysis was performed and the “\$70” annual impact to households calculated. Adding a conservatively low 4-cpg average¹⁴ heating oil price impact due to transportation costs further increases the cost impact to the Interior \$8.0 million annually, again with a slight increase in PM 2.5 emissions, which undercuts the central premise of the Serious SIP. When combined with the two corrections detailed above, the cost per ton removed jumps from ADEC’s original estimate of \$9,692 to \$40,243.

Equitable Treatment for Heating Oil

After discussion with ADEC and review of its calculations and assumptions, Petro Star also learned that the lack of a precursor determination for SO₂ means that sulfur emissions cannot be tied to any particular source.¹⁵ This failure forces ADEC to count all sulfur emissions **twice** – once as part of the analysis for residential heating oil, and again as part of the analysis for point sources. This double counting of sulfur emissions has falsely exacerbated both the planning inventory as well as the impact of a reduction, despite the fact that most of the Best Available Control Technology (BACT) measures imposed on point sources are simply reflections of the current operating conditions. This places the full financial burden of reduced sulfur emissions on residential heating oil consumers, as discussed in detail above. Further, that burden is exaggerated by the faulty calculations over-emphasizing sulfur emissions due to ADEC’s failure to perform a precursor determination. ADEC should take the time necessary to perform this precursor determination instead of penalizing Interior consumers in a manner that results in no reduction of PM 2.5 emissions in the non-attainment area.

As shared in public testimony¹⁶ during an ADEC hearing, Petro Star wants to be part of the solution and work with ADEC, providing the critical information necessary to accurately complete their analysis and seeking to protect Interior consumers from unnecessary cost escalations.¹⁷ Petro Star strongly urges ADEC to delay the implementation of BACM #51 until December 31, 2024, when more impactful control measures affecting solid fuel burning – by far, the largest contributor of PM 2.5¹⁸ – will also take effect. This treats all Interior consumers equitably, as well as grants ADEC additional time to reevaluate its sulfur emissions modeling data and economic analysis. **ADEC must have accurate information in order to justify to Interior residents the significant economic burden it proposes to impose on the community.** This delay also provides the opportunity for Petro Star to proactively pursue an expansion project at its North Pole Refinery to increase the available local supply of #1 Heating Oil, helping to alleviate the supply side concerns and additional transportation costs.

¹⁴ See *Residential Fuel Expenditure Assessment of a Transition to Ultra-Low Sulfur and High Sulfur No. 1 Heating Oil for the Fairbanks PM-2.5 Serious Nonattainment Area, February 2019* detailing that transportation costs ranged from 18 to 20 cents per gallon, depending on the means of importation and origin point.

¹⁵ Reference to meeting and discussions at ADEC Anchorage Office on June 17, 2019 with Commissioner Jason Brune, Cindy Heil and Alice Edwards.

¹⁶ See attached public testimony provided by Angela Speight on June 26, 2019 during ADEC-hosted public hearings in Fairbanks.

¹⁷ See email dated July 11, 2019 from Angela Speight to Cindy Heil clarifying the errors identified with regard to non-road mobile sources and jet fuel consumption in the nonattainment area.

¹⁸ See *Serious SIP Public Notice Draft, Table 7.6-12 demonstrating that Area, Space Heat, Wood Planning Inventory for PM 2.5 emissions equal 2.08 out of a total of 3.70; the next highest PM 2.5 source is Point Sources at 0.83.*

Correcting for the flawed data and using ADEC's own calculations, Petro Star believes it is clear that switching from #2 to #1 Heating Oil would result in a minor **increase** in PM 2.5 emissions overall, thus failing to tackle the core issue the Serious SIP is intended to address, while simultaneously adding materially to the Interior's already considerable energy burden on an annual, recurring basis.¹⁹ This PM 2.5 increase is attributable to the unintended consequence of increased solid fuel burning due to counterproductive price escalations of home heating oil, as explained by ADEC's Elasticity and Substitution Primers.²⁰ While home heating oil is a very minor contributor to PM 2.5 emissions, **BACM #51 imposes nearly all of the initial regulatory and financial burdens onto Interior heating oil consumers.**

Recommendation

For all the reasons noted above, Petro Star submits that BACM #51 should be delayed until December 31, 2024. This shift allows ADEC to correct its flawed analysis while Petro Star works to alleviate supply constraints and additional transportation costs. Just as it did when Flint Hills Refinery shuttered its operations in the Interior, Petro Star will work tirelessly to provide adequate local supply while supporting Alaska's Interior military operations and the F-35 squadron expansions into the future.²¹ We urge ADEC to allow time for industry to minimize the financial impacts to the Interior, rather than penalize Interior heating oil consumers to gain additional time through flawed data and inconsistent calculations.

We thank ADEC for the opportunity to submit these comments and as always, welcome any feedback or questions.

Regards,



Doug Chapados
CEO/President

¹⁹ See email dated July 3, 2019 from Angela Speight to Cindy Heil, and attached spreadsheet with Petro Star Emission Calculations; See email dated July 12, 2019 from Cindy Heil to Angela Speight and attached spreadsheet "BACM #2 to #1 Oil Cost Effectiveness Calcs" under Tabs EFs-BTU and 2 to 1.

²⁰ See Elasticity and Substitution Primers on ADEC website: <https://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/>

²¹ See attached Petro Star Refinery Projects summary dated January 22, 2018 and detailing the efforts Petro Star made to restore local asphalt oil supply to the Interior and provide a lower-cost turbine fuel to Golden Valley Electric Association, lowering the cost for both products to the benefit of the State and Interior consumers.