

MEMORANDUM

TO: EPA Docket No. EPA-HQ-OAR-2019-0282

FROM: Larry Sorrels, Economist
U.S. EPA/OAQPS/HEID/AEG (C439-02)

Date: May, 2019

Subject: Analysis of Illustrative 125% Scenario for MM2A Proposal – Potential Cost Impacts from HAP Major Sources Reducing Emissions as part of Reclassifying to HAP Area Sources

The analysis of the illustrative 125% scenario prepared for the MM2A proposal presents the potential reduction in monitoring, recordkeeping and reporting costs (and permitting costs) associated with a major HAP source reclassifying to an area HAP source. The 125% scenario provides for an alternative scenario in which major sources with actual HAP emissions up to 25% higher than the major source emissions thresholds (10 tons per year for one HAP, 25 tons per year for two or more HAP) reclassify to area source status.¹ For these sources, however, any potential cost savings must be balanced against potential cost increases (either operating & maintenance or capital) they must incur to reduce actual HAP emissions below the major source thresholds, thus allowing them to reclassify. As such, these potential costs are a necessary component of the source's decision of whether to reclassify to area source status.

This memo presents an effort to calculate the potential control cost for reducing HAP emissions for a few source categories. This illustrative analysis is a route by which the potential control costs associated with decisions to reclassify by major sources with actual emissions above the major source thresholds can be characterized. Results of this analysis are not meant to serve as representative of impacts for all source categories affected by this proposal. This analysis is not applicable to sources at the other two scenarios examined in the proposal (50% and 75% HAP emissions cut-offs) because sources affected by those scenarios have actual HAP emissions already below the major source emissions thresholds.

The EPA is requesting comments on the methodology for this illustrative control cost analysis of the illustrative 125% scenario employed for the MM2A proposal.

¹ A more detailed description of the 125% alternative scenario can be found in Memorandum, Brian Palmer, Eastern Research Group (ERG) to Eric Goehl, Elineth Torres, Brian Shrager, and Larry Sorrels, U.S. EPA. Documentation of the cost savings analysis for the proposed rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act.” May, 2019.

Coverage of Source Categories for this Analysis

EPA's review of the MM2A analysis of potential cost savings for the illustrative 125% emissions scenario showed that there is a wide variety of sources across affected source categories. We reviewed the list of number of major sources expected to reclassify as area sources under this scenario.² For this analysis, we selected the source categories that our earlier analysis had shown have the highest potential for cost savings. Based on review of this list, the top five source categories by number of sources are:

- Miscellaneous Metal Parts coatings (17% of total)
- Wood Furniture coatings (15% of total)
- Turbines (9% of total)
- Printing and Publishing coatings (6% of total)
- Miscellaneous Organic NESHAP (6% of total, with fewer sources than Printing and Publishing coatings)

Table 1 provides a list of the source categories and the number of sources that are impacted under the illustrative 125% scenario.

Table 1. List of Source Categories Included in Potential Cost Impact Analysis, and Number of Affected Sources for Each

Source Category	Number of Affected Sources
Miscellaneous Metal Parts coatings	316
Wood Furniture coatings	277
Turbines*	160
Printing and Publishing coatings	115
Miscellaneous Organic NESHAP (MON)	106

*The stationary turbines source category was excluded from the illustrative emissions analysis as noted in the emissions memorandum for this proposal. We include the stationary turbines category in this analysis for the proposal since it meets the criterion set for source category inclusion.

² U.S. EPA. Proposal MM2A DataSpreadsheetMay_2019.xls. Available in the docket for this rulemaking.

These five source categories constitute 52% of the total number of sources affected under this illustrative scenario. Two of these categories (miscellaneous metal parts and wood furniture) are included in the illustrative emissions impacts analysis of six source categories included in the RIA, and part of this analysis included impacts for the illustrative 125% scenario. The illustrative emissions analysis examined the potential for sources in these categories to reclassify and the potential impacts on emissions. The impact on costs was *not* a part of this emissions analysis; it was an analysis based on control technologies/techniques likely to be in place for sources and if non-HAP regulatory requirements may exist to reduce or prevent the potential for reclassifying.

Illustrative Potential Cost Analysis Approach for 125% Scenario

In this analysis, we perform a “break-even” analysis to help inform whether a source would choose to apply additional control technologies to reduce emissions under the scenario. This analysis includes the use of HAP-add-on-control cost-effectiveness estimates (that is, annual cost per ton of HAP reduction) for each of the five source categories. These estimates reflect the costs of HAP regulations previously imposed on these source categories or represent EPA estimates of likely control options that sources could use to meet HAP emissions limits. We then use these estimates in our approach to examine if sources in these source categories would apply add-on-controls to reduce emissions as part of reclassification.

The cost-effectiveness estimates used in this analysis will include both capital (fixed) and O&M (variable) costs, for there was insufficient information in the documentation for these estimates to break out annual costs into these two components. To limit double counting, we derived, to the extent possible, cost-effectiveness estimates that do not include any monitoring, recordkeeping and reporting costs that are already found in the cost-savings analysis done for these source categories. We recognize that findings from the review of the 34 reclassified sources noted in the emissions memo appear to show that the HAP add-on-control equipment in place prior to reclassification continues to be operated after reclassification.³ Thus, the most relevant cost for a determination of what cost value is “break-even” would be the O&M costs. Using these HAP cost-effectiveness estimates could therefore lead to an overstatement of the annual cost per ton that could serve as a “break-even” value for a source to reduce emissions as part of reclassifying from major to area source. The use of results from this analysis should only be regarded as illustrative, for they do not include results from all, or even most, source categories potentially affected by this proposal. Thus, they cannot be used to present a complete treatment of control cost impacts for the illustrative 125% scenario.

We also acknowledge that the costs in these estimates may not reflect true marginal costs in that they presume the average costs of add-on-controls are suitable for “break-even” decision-making by major sources considering reclassification.

Table 2 presents the HAP cost-effectiveness estimates used in this analysis for each of the five source categories. All cost-effectiveness estimates are in 2014 dollars to be consistent with

³ U.S. EPA. Memorandum from Elineth Torres to Docket No. EPA-HQ-OAR-2019-0282. Documentation of the emission impacts analysis for the proposed rulemaking “Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act.” May, 2019.

the year dollars for the annual cost savings estimates presented in the cost memo and RIA for this proposal.

Table 2. HAP Cost-Effectiveness Estimates for Source Categories Included in Potential Cost Impact Analysis

Source Category	HAP Cost-Effectiveness Estimate (annual cost/ton HAP reduction in 2014\$)
Miscellaneous Metal Parts coatings	\$ 3,070
Wood Furniture coatings	\$32,363
Turbines	\$96,682
Printing and Publishing coatings	\$75,218
Miscellaneous Organic NESHPAP (MON)	\$21,300

Determining the appropriate cost-effectiveness estimates for the source categories in this analysis was not a simple matter. There are often differences in the extent and timing of cost analyses for different source categories, and determining an appropriate cost-effectiveness estimate may require more than trivial amounts of analysis in individual circumstances. Below is a brief discussion of the cost-effectiveness estimates for each source category and how they are derived.

Cost-Effectiveness Estimate Derivation

Miscellaneous Metal Parts coatings – We derived this estimate by dividing the total annualized cost for the 2003 final major source NESHPAP by the expected HAP emission reductions. For this final rule, the total annualized cost was \$47.3 million (in 1997 dollars) and the expected emission reductions were 25,822 tons/year.⁴ The cost effectiveness is \$2,204/ton HAP emission reduction in 1997 dollars. We used the U.S. Gross Domestic Product (GDP) implicit price deflator to escalate to 2014 dollars. This value is 1.393, where the 2014 value is

⁴ U.S. EPA. NESHPAP for Miscellaneous Metal Parts and Products, Final Rule. 69 FR 130. Published on January 2, 2004. Available at <https://www.govinfo.gov/content/pkg/FR-2004-01-02/pdf/03-21917.pdf>. Downloaded on May 14, 2019.

103.680 and the 1997 value is 74.445.⁵ Therefore, the cost effectiveness in 2014 dollars is \$3,070/ton.

Wood Furniture coatings – We took this estimate from an EPA cost memorandum prepared in 2010 to examine HAP control options for facilities subject to the wood furniture coatings major source NESHAP.⁶ The use of low VOC coatings is the control option we used in the current analysis as the basis for the cost-effectiveness estimate. The VOC cost-effectiveness estimate for this option is \$15,000/ton; with the amount of VOC that is HAP estimated at one-half, the resulting HAP cost effectiveness is \$30,000/ton. With this estimate in 2010 dollars, we escalated the value to 2014 dollars using the U.S. GDP implicit price deflator. This value is 1.079, where the 2014 value is 103.680, and the 2010 value is 96.111.⁷ Therefore, the cost effectiveness in 2014 dollars is \$32,363/ton.

Turbines – We derived this estimate from an EPA memorandum that provides cost-per-ton estimates for control options applied to turbines of different sizes. We did not include emergency turbines in this estimate since these sources only operate at limited times in a year. Presuming the use of prime mover turbines only, and using values based on average emission factors for calculating baseline HAP emissions, we derived a cost-effectiveness estimate of \$70,202/ton in 1998 dollars. We used the U.S. Gross Domestic Product (GDP) implicit price deflator to escalate to 2014 dollars. This value is 1.377, where the 2014 value is 103.680 and the 1998 value is 75.283.⁸ Therefore, the cost effectiveness in 2014 dollars is \$96,682/ton.

Printing and Publishing – We took this estimate from a retrofit cost estimate of \$50,000/ton (1993\$) from a cost analysis for the final Printing and Publishing major source NESHAP for the use of a permanent total enclosure to confine VOC or HAP emissions.⁹ We used the U.S. Gross Domestic Product (GDP) implicit price deflator to escalate to 2014 dollars. This value is 1.504, where the 2014 value is 103.680 and the 1993 value is 68.920.¹⁰ Therefore, the cost effectiveness in 2014 dollars is \$75,218/ton.

⁵ U.S. Federal Reserve Board, St. Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on May 14, 2019.

⁶ U.S. EPA. Memorandum from Kaye Whitfield to Docket No. EPA-HQ-OAR-2010-0786. Cost Analyses for Control Options. September 27, 2010. Prepared for the Wood Furniture Manufacturing Operations NESHAP, Final Rule.

⁷ U.S. Federal Reserve Board, St Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on May 14, 2019.

⁸ U.S. Federal Reserve Board, St. Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on May 14, 2019.

⁹ U.S. EPA. Printing and Publishing Industry NESHAP, Final Rule. 61 FR 27132. Published on May 30, 1996. Available at <https://www.govinfo.gov/content/pkg/FR-1996-05-30/pdf/96-13084.pdf>. Downloaded on May 15, 2019.

¹⁰ U.S. Federal Reserve Board, St. Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on May 14, 2019.

Miscellaneous Organic NESHAP (MON)- We took this estimate from the final rule notice, in which the cost effectiveness of several control options was examined. These control options generally ranged from \$15,000-\$51,000/megagram (Mg) (or \$13,640-\$46,410/ton) in 1998 dollars. Given the predominance of control options that were between \$15,000-\$19,000/Mg (or \$13,640-\$17,290/ton), we used the midpoint of the latter range to come up with a cost effectiveness for the current analysis of \$15,470/ton in 1998 dollars.¹¹ We used the U.S. Gross Domestic Product (GDP) implicit price deflator to escalate to 2014 dollars. This value is 1.377, where the 2014 value is 103.680 and the 1998 value is 75.283.¹² Therefore, the cost effectiveness in 2014 dollars is \$21,300/ton.

Illustrative Results for Potential Cost Impact Analysis Considering the Illustrative Emissions Analysis

The two source categories that are included in both the illustrative emissions analysis, which can be found in the cost memo and in the RIA, and this potential cost analysis are wood furniture and miscellaneous metal parts and products. The net change in HAP emissions for these source categories according to the results of the illustrative emissions analysis was a decrease in the range of 0-125 and 0-160 tons, respectively.¹³ As stated in the emissions memo and RIA, we did not consider the cost of add-on-controls when calculating the illustrative changes in emissions for each source category included in the analysis.

If we use cost-effectiveness estimates to calculate a potential cost of add-on-control for the emissions decreases obtained by the illustrative emissions analysis for these two source categories, we estimate a potential annual control cost (in 2014 dollars) of \$4,045,250 for the wood furniture source category and \$0-491,200 for the miscellaneous metal parts and products source category. Comparing these estimates to those for potential cost savings under the illustrative 125% scenario for these source categories, which are \$352,599 for wood furniture and \$1,356,728 for miscellaneous metal parts and products,¹⁴ we find that the potential net cost change (control cost minus cost savings, where a negative sign means cost savings) for these source categories is -\$352,599 to \$+3,692,651, and \$-1,356,728 to \$-865,528, respectively.¹⁵ Thus, these illustrative analyses suggest that there could be net potential cost

¹¹ U.S. EPA. Miscellaneous Organic NESHAP (MON), Final Rule. 68 FR 63852. Published in the Federal Register on November 10, 2003. Available at <https://www.govinfo.gov/content/pkg/FR-2003-11-10/pdf/03-22310.pdf>. Downloaded on May 14, 2019.

¹² U.S. Federal Reserve Board, St. Louis. Gross Domestic Product (GDP implicit price deflator). Index: 2012-100. Annual Values. Available at <https://fred.stlouisfed.org/series/A191RD3A086NBEA>. Downloaded on May 14, 2019.

¹³ U.S. EPA. Memorandum from Elineth Torres to Docket No. EPA-HQ-OAR-2019-0282. Documentation of the emission impacts analysis for the proposed rulemaking “Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act.” May, 2019.

¹⁴ Estimates of potential cost savings shown here for each of these two source categories are the increment of impact between the 125% scenario and the 75% scenario. Increments calculated using estimates by source category found in Appendix 2 of Memorandum, Brian Palmer, Eastern Research Group (ERG) to Eric Goehl, Elineth Torres, Brian Shrager, and Larry Sorrels, U.S. EPA. Documentation of the cost savings analysis for the proposed rulemaking “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act.” May, 2019.

¹⁵ U.S. EPA. Proposal MM2A DataSpreadsheetMay_2019. Available in the docket for this rulemaking.

savings when add-on-control costs are considered for the miscellaneous metal parts and products category, while there is more uncertainty with net cost savings for the wood furniture category.

Limitations of This Analysis

There are three limitations with this analysis that are important to mention. First, as we indicated earlier, the cost-effectiveness estimates derived for this analysis are likely to be overestimates of the potential cost of controls that major HAP sources at the 125% emissions threshold would incur to reduce actual emissions for purposes of reclassifying to area source status. This is because they include capital costs, which may not be a factor in reclassification decisions according to the review of reclassified major sources done for this proposal. Thus, the results of this “break-even” analysis may underestimate the potential for additional emission reductions for reclassification purposes by overstating the “break-even” costs for these source categories.

Second, we also note that the extent of cost escalation in this analysis is often driven by the vintage of the cost data used as the basis for the cost-effectiveness estimates. For four of these estimates, the escalation period is longer than five years. This is not consistent with the recommendation in the EPA Air Pollution Control Cost Manual that five years is the preferred duration for cost escalation.¹⁶ Given the age of the cost data, however, we did not have an alternative to adjust these costs into 2014 dollars.

Third, we also acknowledge that the costs included in these estimates may not reflect true marginal costs for major sources in that they presume the average costs of control are suitable for “break-even” decision-making by major sources considering reclassification, while decisions by sources to reduce emissions will be made based on their marginal costs of control and production on the margin of affordability.

¹⁶ U.S. EPA. EPA Air Pollution Control Cost Manual. Section 1, Chapter 2. Cost Estimation: Costs and Methodology. February 1, 2018. Available at https://www.epa.gov/sites/production/files/2017-12/documents/epaccmcostestimationmethodchapter_7thedition_2017.pdf. p. 19.