MEMORANDUM

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

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

Date: August 2020

Subject: Analysis of the illustrative 125 percent scenario (alternative scenario 2) — potential cost impacts from HAP major sources reducing emissions as part of reclassifying to HAP areas sources under the rule "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act"

The analysis of the scenario that illustrates sources operating at 125 percent of the major source threshold (MST), or alternative scenario 2, prepared for the MM2A action focuses on major sources with actual HAP emissions at or above the major source emission thresholds (10 tons per year [tpy] for a single HAP, or 25 tpy of two or more HAP) up to 25 percent higher than the MST. In order to be eligible to reclassify to area source status, a source in this scenario will need to take enforceable PTE limitations below the MST and reduce its actual HAP emissions accordingly. The cost analysis for this scenario includes the permitting costs incurred by the source to reclassify and the reduction in monitoring, recordkeeping and reporting costs associated with the reclassification to area source status. In addition, the sources in this scenario will incur some costs (either operating & maintenance (O&M) or capital) to further reduce actual emissions below the MST.

This memo presents an illustration of how sources in the alternative scenario 2 might be able to reduce emissions necessary to reclassify, and then calculate the potential control cost for reducing HAP emissions from these sources. This illustrative analysis is one way to characterize the potential control costs that a major source with actual emissions above the major source thresholds will consider in order to determine whether to seek reclassification to area source status. We analyze the potential control costs associated with the reduction of HAP emissions sufficient for sources with emissions up to 125 percent of the MST (or alternative scenario 2) to reach the MST.[1] Results of this analysis are not meant to serve as representative of impacts for all source categories potentially affected by this final rule. This analysis is not applicable to sources at the other two alternative scenarios examined in this final action (50 percent of the MST in alternative scenario 1, and 75 percent of the MST in the primary scenario), because sources affected by those scenarios have actual HAP emissions already below the MST.

[1] Eastern Research Group (ERG) for U.S. EPA. Memorandum. Documentation of the Data for Analytical Evaluations & Summary of Industries Potentially Impacted by the Final Rule "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act." August 2020.

The analysis is an update to the analysis conducted for the proposed MM2A rule.[2] This updated analysis reflects the revisions to the source inventory prepared for the cost and emission analyses completed for the final rule. Please refer to the final rule technical support memorandums (TSMs) on the MM2A database, cost analysis, and emission impacts for more information on the revisions.

Source Categories Included in Analysis

At proposal, we presented this analysis for six source categories to illustrate the costs some sources may decide to incur to if they opt to reclassify under MM2A. The source categories evaluated at proposal have been updated and include hydrochloric acid production (HCl), miscellaneous organic NESHAP (MON), organic liquids distribution (OLD), surface coatings of miscellaneous metal parts, stationary turbines[3], surface coating of metal cans, and wood furniture. We received public comments requesting that we expand our analyses, including the illustrative 125 percent scenario analysis, to additional source categories. Some commenters expressed that this illustrative analysis overestimated the potential for emission reductions from source categories, given that findings from most of the proposed and final residual Risk and Technology Reviews (RTRs) have found no advancements in control technologies, whether due to technical infeasibility, or found not to be cost-effective, available to further reduce HAP emissions.[4]

To select the source categories for the final rule illustrative analysis, we reviewed the results of the MM2A database update and facility count by source category under alternative scenario 2 and the results of the illustrative emissions analysis for the final rule.[5] There are a total of 74 source categories in the MM2A database for which we have detailed RTR modeling file data to determine which analytical scenarios they belong in. Sorting the MM2A database for those facilities with actual emissions between the MST and 125 percent of the MST displays 39 source categories - 24 of source categories are in heavy industry and 15 source categories in the coatings sector.

Then, we removed from consideration for this analysis those source categories for which we were unable to analyze in the emission impacts analysis due to insufficient information, specifically, Brick Manufacturing, OSWRO, P&R III, P&R IV (includes 5 categories), Pesticide Active Ingredients, Pharmaceuticals, and Site Remediation (see Table 2 of the TSM for the

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2U.S. EPA, Larry Sorrels, OAQPS/HEID/AEG. 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. EPA Docket No. EPA-HQ-OAR-2019-0282. May 2019. Available at https://www.epa.gov/sites/production/files/2019-06/documents/mm2a_proposal_memorandum_cost_considerations_125percent_scenario_final.pdf and in the docket for this rulemaking.

[3] It is noted that the stationary turbines source category is not part of this analysis for the final rule, though this category was included in the 125 percent scenario analysis at proposal. As described in the MM2A database memo, the sources in this category could reclassify absent MM2A. Hence, this source category is not included in the analysis for the final rule.

[4] U.S. EPA. Response to Comments (RTC) Document for MM2A. August 2020.

[5] U.S. EPA. MM2A DataSpreadsheet_2020. Available in the docket for this rulemaking.

emissions analysis) and focused on those source categories that might utilize add on control technologies to reduce emissions further.[6] The source categories left that have sources with emissions between the MST and alternative scenario 2 are listed in Table 1.

Table 1. Source Categories Considered for Final Rule Illustrative Analysis of Alternative Scenario 2

Source Categories	
Engine Test Cells/Stands	Petroleum Refineries (2 categories)
Leather Manufacturing	Secondary Aluminum
Marine Vessel Loading	Steel Pickling
Plywood and Composite Wood Products	Wet-Formed Fiberglass

From the list of source categories in Table 1, we then determined that Leather Manufacturing, Petroleum Refineries, Secondary Aluminum, and Wet-Formed Fiberglass would not change emissions under the alternative scenario 2 for reasons provided in the emissions memo and documentation included in the docket. Therefore, the remaining four source categories available for this analysis in addition to the source categories included at proposal are: Engine test cells/stands, marine vessel loading, plywood and composite wood products (PCWP), and steel pickling. According to relevant proposal or final RTRs, there are no add-on control technologies to further reduce emissions in the Engine test cells/stands, PCWP, and steel pickling source categories.[7, 8] Thus, of the 8 source categories in Table 1 only the marine vessel loading source category was added to the final illustrative alternative scenario 2 analysis.

Table 2 provides a list of the seven remaining source categories and the number of sources in the alternative scenario 2 scenario in descending order. According to the illustrative emission analysis these sources could further reduce emissions in order to reclassify. We note that these seven source categories contain 104 sources that constitute 19 percent of the 542 major sources across all source categories with sources having emissions between the MST and alternative scenario 2. These source categories thus account for 19 percent of all the sources in the alternative scenario 2 and are listed in descending order of number of sources in the scenario. In addition, Table 2 includes the amount of emissions change estimated for each source category that could result if these sources were to reclassify. The change in emissions is calculated as the difference between actual emissions listed for the source in the MM2A database down to 75 percent of the MST.

[6] We presume that the coatings categories would rely on reformulations which would be too costly to pursue for reclassification. However, after reviewing the operating permits for some coatings categories at proposal, we found that some could reduce emissions and reclassify (i.e., wood furniture).

[7] U.S. EPA. NESHAP: Plywood and Composite Wood Products Residual Risk and Technology Review. Proposal. 81 FR 47092. September 6, 2019. Available on the Internet at https://www.govinfo.gov/content/pkg/FR-2019-09-06/pdf/2019-18827.pdf.

[8] U.S. EPA. Appendix A: Illustrative Emission Impact Memorandum - Detailed Source Category Characterizations for the Final MM2A Rule.

Table 2. List of Source Categories with HAP Emissions Between the MST and Alternative Scenario 2 and Potential Emission Reductions if Sources were to Reclassify

Source Category	No. of Sources in Alternative Scenario 2	Emissions Change by Source Category with Reclassification (tpy)*
Miscellaneous Metal Parts	48	-79
Wood Furniture	28	-17
Miscellaneous Organic NESHAP (MON)	9	-59
Marine Tank Vessel Loadings	9	-23
Organic Liquid Distribution (OLD)	8	-18
Metal Can	1	-4
HCl Production	1	-0.7

*A negative sign denotes an emissions decrease. Emission changes are in terms of combined HAP (two or more HAP). Tpy = tons emissions/year.

Illustrative Potential Cost Analysis Approach

In this memorandum, we perform a "break-even" analysis to help inform whether a source in Table 2 would choose to apply add-on control devices and other control techniques to reduce emissions under alternative scenario 2. We note that the impact on control costs was not a part of the illustrative emissions analysis that is a basis for the data in this memo; that analysis was based on emissions control technologies/techniques likely to be already in place at sources, and if non-HAP regulatory requirements may exist to reduce or prevent the potential for reclassifying (e.g., fabric filters for particulate matter (PM) control can also control metallic HAP), and other factors as mentioned earlier in this memo.

Our analysis accounts for the findings of technology reviews prepared as part of recently proposed or promulgated RTRs. If a technology review for one of the seven source categories in Table 2 finds that no control technologies are available for additional control of HAP emissions, then our analysis will not include any estimates of control costs or emission reductions for this category. With that as a basis, we do not include any HAP control as part of the analysis of costs related to potential reclassification for the following three source categories: HCl production,

Surface Coating of Metal Cans, and Miscellaneous Metal Parts. We find that there are available control technologies and practices for the following four source categories: MON, Marine Tank Vessel Loading Operations, Organic Liquid Distribution (OLD), and the Wood Furniture coatings source categories, based on the findings of the technology review for the final MON RTR,[9] technical documentation for the Marine Tank Vessel source category, the final OLD RTR,[10] and technical documentation for the Wood Furniture coatings source category.

This analysis includes the use of HAP control cost-effectiveness (that is, annual cost/ton HAP reduction) estimates for each of the relevant four source categories. These estimates can reflect the costs of HAP regulations previously imposed on these source categories or represent estimates of likely control options that sources could use to meet HAP emissions limits if such options exist. These estimates are then used in our approach to examine if sources in these source categories would apply representative control devices or techniques to reduce HAP emissions as part of an effort to reclassify. 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 present a breakout of annual costs into these two components.

We also 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 completed for these source categories to avoid double counting such costs. We recognize that findings in the review of reclassifications show that the HAP control equipment in place prior to reclassification continues to be operated after reclassification of a majority of these sources.[11] Hence, with the control costs continuing to be incurred, 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 therefore could 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. Again, use of results from this analysis should only be regarded as illustrative, for they do not reflect results from all, or most, source categories potentially affected by this final action. Thus, they should not be used to present a complete analysis across all source categories with sources having emissions above the MST but below alternative scenario 2.

We also acknowledge that the costs in these estimates may not reflect true marginal costs in that they presume the average costs of control, which are the types of costs available in the

[9] U.S. EPA. NESHAP for Miscellaneous Organic Chemical Manufacturing, Residual Risk and Technology Review. Proposed Rule. 84 FR 69182. Published on December 17, 2019. Available at https://www.federalregister.gov/documents/2019/12/17/2019-24573/national-emission-standards-for-hazardous-air-pollutants-miscellaneous-organic-chemical. Downloaded on February 18, 2020.

[10] U.S. EPA. NESHAP for Organic Liquid Distribution, Residual Risk and Technology Review. Final Rule. Signed on March 12, 2020. Available in pre-publication form for the Federal Register at https://www.epa.gov/stationary-sources-air-pollution/final-amendments-air-toxics-standards-organic-liquids-distribution. Downloaded on May 5, 2020.

[11] U.S. EPA. Memorandum from Elineth Torres to Docket No. EPA-HQ-OAR-2019-0282. Review of reclassification actions for the rule "Reclassification of Major Sources as Area Sources under Section 112 of the Clean Air Act." August 2020.

documentation available to the EPA, are suitable for "break-even" decision-making by major sources that may be considering reclassification.

Availability of HAP Control Technologies/Practices

We presume in this analysis that major sources would not choose to apply new controls that are available for installation but are deemed by the EPA to not be cost-effective in the context of a proposed or final RTR for the relevant source category. Since a decision by a major source to reclassify is voluntary, a source could choose to incur control cost for HAP emission reductions if the source's emissions are above the major source thresholds. Such a decision will be made by the source's parent company based on a variety of factors, including but not limited to the effect on profitability and its ability to change its output. Table 3 presents the HAP cost-effectiveness estimate used in this analysis for each of these source categories. All of these cost-effectiveness estimates are in 2017 dollars in order to be consistent with the year dollars for the annual cost savings estimates presented in the cost TSM and RIA for this final action.

Table 3. HAP Cost-effectiveness Estimates for Source Categories with Available Control Technologies and Practices Included in Potential Cost Impact Analysis*

Source Category	HAP Cost-Effectiveness Estimate (annual cost/ton HAP reduction in 2017$)
Marine Tank Vessel Loading Operations	$35,074
Miscellaneous Organic NESHAP (MON)	$36,572
Organic Liquid Distribution (OLD)	$ 2,958
Wood Furniture Coatings	$33,645

* The EPA notes that while some of the cost effectiveness values used in this analysis are above the range that we have typically found to be cost effective, an individual source's circumstances may result in higher or lower cost-effectiveness values that, while sometimes serving as decision-making tools for EPA analyses, may not serve as a key consideration for facilities when determining to reduce emissions. We employ the values in this analysis to illustrate the potential costs of reducing emissions to a level below the MST. This illustration assumes that if sources find a particular annual cost value to be lower than the potential gains they may accrue as a result of reclassification, then they will adopt the value per ton. The metric that sources are likely to use for a determination of whether they should install controls to reduce emissions in order to reclassify is *cost per dollar saved*, or the break-even value at which the financial benefits from reclassification will exceed costs.

Determination of the appropriate cost-effectiveness value for each source category to use in this analysis is not always a straightforward matter. There is often differences in the extent and timing of cost analyses for different source categories, and determination of an appropriate cost-

effectiveness value may require more than trivial amounts of analysis in individual circumstances. Below is a brief discussion of the cost-effectiveness estimates for each category that has available control technologies and practices and how these estimates are derived.

Cost-Effectiveness Estimate Derivation

Wood Furniture coatings – The estimate was taken from an EPA cost memorandum prepared in 2010 to examine HAP control options for facilities subject to the wood furniture coatings MACT.[12] The control option that is the basis for the cost-effectiveness estimate used in the current analysis is the use of low VOC coatings. 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 2017 dollars by using the U.S. GDP implicit price deflator. This value is 1.120, where the 2017 value is 107.789 and the 2010 value is 96.111.[13] Therefore, the estimate of cost-effectiveness in 2017 dollars is $33,645/ton (30,000 * (107.789/96.111)).

Miscellaneous Organic NESHAP (MON)- The estimate was taken from the proposal RTR Federal Register notice, in which the cost-effectiveness of several control options was examined. There are two control options that are co-proposed in the RTR, and have cost-effectiveness that ranges from $32,586-$39,206/ton)[14] in 2016 dollars. We use the midpoint of the range to derive a cost-effectiveness for the current analysis of $35,896/ton in 2016 dollars.[15] Escalation to 2017 dollars is accomplished the U.S. Gross Domestic Product (GDP) implicit price deflator. This value is 1.019, where the 2016 value is 105.798 and the 2017 value is 107.789.[16] Therefore, the estimate of cost-effectiveness in 2017 dollars is $36,572/ton (35,896 *(107.789/105.798)).

Marine Tank Vessel Loading Operations – The estimate was taken from the preamble for the final Marine Tank Vessel Loading Operation NESHAP published in September 1995.[17] The estimate is based on the upper bound of estimated control costs ($60 to $100 million annually

[12] 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.

[13] 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.

[14] These estimates assume potential excess emission reductions from flares. See the MON RTR for more details.

[15] 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.

[16] 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 February 19, 2020.

[17] Federal Register. U.S. EPA, Federal Standards for Marine Tank Vessel Loading Operations and National Emission Standards for Hazardous Air Pollutants for Marine Tank Vessel Loading Operations. 60 FR 181. September 19, 1995. Available at https://www.govinfo.gov/content/pkg/FR-1995-09-19/pdf/95-22725.pdf.

nationwide) for this final NESHAP. No other information on costs or cost-effectiveness was available from actions on this source category since 1995. This cost estimate is $21,906/ton annually in 1992 dollars. Escalation to 2017 dollars is accomplished the U.S. Gross Domestic Product (GDP) implicit price deflator. This value is 1.019, where the 1992 value is 67.321 and the 2017 value is 107.789.[18] Therefore, the estimate of cost-effectiveness in 2017 dollars is $/ton (21,906 *(107.789/67.321)) = $35,074/ton.

Organic Liquid Distribution (OLD) – The estimate was taken from the national impacts memorandum for the final OLD RTR.[19] The estimate includes the control costs for two types of control techniques – lowering the vapor pressure threshold at storage tanks, and storage tank degassing. We do not include other control techniques in this memorandum due to lack of emission reduction estimates. This cost estimate is $2,903/ton annually in 2016 dollars. Escalation to 2017 dollars is accomplished the U.S. Gross Domestic Product (GDP) implicit price deflator. This value is 1.019, where the 2016 value is 105.798 and the 2017 value is 107.789.[20] Therefore, the estimate of cost-effectiveness in 2017 dollars is $/ton (2,903 *(107.789/105.798)) = $2,958/ton.

Results for Potential Cost Impact Analysis Considering the Illustrative Emissions Analysis

The source categories in Table 3 are those included in both the illustrative emissions analysis, which can be found in the cost TSM and in the RIA, and this potential cost analysis. The net change in HAP emissions for these source categories that is expected from potential reclassifications is a decrease of 173 tpy, with a decrease of 59 tpy from the MON source category as the largest change in magnitude.[21]

In this memorandum, we conduct an analysis to determine the cost to reduce emissions for the four source categories that are expected to have emissions increases with reclassification according to the illustrative emissions analysis. We use cost-effectiveness estimates to calculate a potential annual cost of control for reducing the emissions increases obtained by the illustrative emissions analysis for the four source categories that could experience them. The cost-effectiveness estimates are multiplied by the emissions change for each source category as indicated in Table 3 to obtain the potential annual cost of control for that source category. Table 4 shows the potential annual cost savings at the alternative scenario 2 in 2025 and beyond (the

[18] 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 April 23, 2020.

[19] ERG to Neil Feinberg, US EPA/OAQPS/SPPD. National Impacts of the 2020 Risk and Technology Review Final Rule for the Organic Liquids Distribution (Non-Gasoline) Source Category. March 5, 2020. The cost estimate we prepare here does not include enhanced monitoring for flares and removal of an exemption for control of transfer racks, for emission reductions were not estimated from applying these two control techniques due to lack of data.

[20] 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 February 19, 2020.

[21] U.S. EPA. Appendix A: Illustrative Emission Impact Memorandum - Detailed Source Category Characterizations for the Final MM2A Rule.

expected time when all potential reclassifications have taken place), the potential annual cost of control, and potential net annual cost savings for each of these source categories.

Table 4. Potential Cost Impacts in 2025 and Beyond to HAP Source Categories with Sources Eligible to Reclassify Under the Alternative Scenario 2 and Having Available HAP Control Technologies or Techniques (2017$)*

Source Category	Annual Cost Savings in 2025 and Beyond	Annual Control Costs	Net Annual Cost Savings
MON	$8,053,774	$2,160,502	$ 5,809,272
Marine Tank Vessel Loadings	-37,180	806,700	- 843,820
OLD	1,612,570	53,240	1,559,330
Wood Furniture	1,903,678	571,965	1,331,713

*A minus sign denotes a negative number; no sign denotes a positive number. The net annual cost savings = (annual cost savings in 2025 and beyond) – annual control costs.

These results show that there are positive net annual cost savings to three of the remaining four source categories as part of eligible sources potentially reclassifying from major HAP to area HAP sources. Thus, this illustrative cost analysis suggests there may be some positive return to sources in these categories under alternative scenario 2 that may choose to reclassify, all things considered.

Limitations of This Analysis

There are three limitations with this analysis of the illustrative alternative scenario 2 scenario that are important to mention. First, as we indicate earlier in this memo, the cost-effectiveness estimates derived for this analysis are likely to be overestimates of the potential cost of control that major HAP sources at the alternative scenario 2 would incur to reduce emissions for purposes of reclassifying to area source status for these estimates include capital costs, which may not be a factor in reclassification decisions according to the review of reclassified major sources done for this final action. Thus, the results of this "break-even" analysis may understate the potential for additional emission reductions for reclassification purposes by overstating the "break-even" costs for these source categories.

Second, we note that the extent of cost escalation in this analysis is often driven by the vintage of the cost data that is the basis for the cost-effectiveness estimates. The estimate of costs used for the wood furniture coatings category uses an 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.[22] Given the age of the cost data, however, we did not have an alternative to convert these costs into 2017 dollars.

Third, we 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 that serve as the basis for the cost-effectiveness estimates 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 their affordability, among other factors. No marginal cost data is available for HAP control technologies or techniques for the source categories included in this memo.

[22] 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.