

MEMORANDUM

To: Eric Goehl, Elineth Torres, Lisa Conner, Larry Sorrels, Rod Truesdell, and Brian Shrager, EPA/OAQPS

From: Eastern Research Group, Inc.

Date: August 2020

Subject: Documentation of the compliance cost savings analysis for the rule “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act”

1. Overview and Introduction

The purpose of this memorandum is to document the compliance cost savings analysis of the final rulemaking titled, “Reclassification of Major Sources as Area Sources under Section 112 of Clean Air Act,” also known as the Major MACT to Area (MM2A) rule. The final rule implements a plain language reading of the “major source” and “area source” definitions of section 112 of the Clean Air Act (CAA). The final rule would allow major sources of hazardous air pollutants (HAP) to reclassify to area source status at any time including after the first substantive compliance date of an applicable major source National Emission Standard for Hazardous Air Pollutants (NESHAP) (*i.e.*, a maximum achievable control technology (MACT) standard), provided those sources reduce their emissions of and potential to emit (PTE) HAP below the major source thresholds (*i.e.*, 10 tons per year [tpy] of any single HAP or 25 tpy of any combination of HAP; henceforth referred to as MST). For further background, see the preamble to the final MM2A rule.

If a source voluntarily chooses to reclassify to area source status, they will no longer be subject to previously applicable major source NESHAP, which will result in compliance cost savings for the source. However, the source will be required to comply with applicable area source NESHAP in response to reclassification, which will result in some compliance costs. Facilities will also have costs associated with applying to modify the facility’s operating permit when they reclassify from major to area source status. Air pollution control permitting agencies will also have costs to process those applications. Overall, the sum of costs and cost savings of actions taken to reclassify is a net annual cost savings.

This memo presents the procedure followed to estimate the potential compliance cost savings for the facilities in each major source NESHAP source category that currently emit below the MST. Based on the methodology presented in detail below, the total cost of the MM2A final rule in our primary illustrative analytical scenario (*i.e.*, facilities with actual emissions below 75 percent of the MST) once the policy is fully implemented is a savings of about (\$91) million. This is an illustrative analysis because this rulemaking does not mandate facilities to reclassify and the actual decision for a facility to reclassify is voluntary and will be based on numerous factors specific to each facility. The EPA is only able to approximate the number of facilities that currently emit below the MST and cannot estimate the total number that will actually reclassify in any particular source category.

The memo titled “*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”*” (Hereafter referred to as “the MM2A database memo”) documents the data and methods used to estimate the number of facilities in each source category with emissions below specific emission thresholds.¹ We received public comments on the analyses conducted at proposal requesting the EPA to expand the analyses to evaluate all major sources in the NESHAP program. For the final rule, we evaluate impacts on all source categories included in the major source NESHAP program and provide some insights to illustrate the potential response to the MM2A rule. As discussed in the MM2A database memo, of the 114 NESHAP source categories, the EPA determined early in the analysis of potential impacts that the MM2A rule would not affect facilities in 13 source categories. For 74 source categories, the EPA used RTR modeling file data to estimate the number of facilities in each source category and the HAP emissions from each facility. Among these 74 RTR source categories, the EPA determined that that the MM2A rule would not affect facilities in 16 source categories. For the remaining 27 source categories, the EPA generally estimated the number of facilities from the ECHO database and extrapolated the number of facilities that would be affected from the source categories for which the EPA had RTR modeling data files. Among these 27 source categories, the EPA determined that that the MM2A rule would not affect facilities in nine source categories. In summary, we determined that facilities in 38 source categories would not be affected by the MM2A rulemaking.

2. Description of Analytical Scenarios included in the Cost Analysis

To assess the impacts associated with the MM2A final rulemaking, one would need to know which sources will reclassify from major source to area source status. Because the EPA does not know which sources will reclassify, for purposes of this rulemaking, we assess potential impacts for three illustrative scenarios, each using a different analytical threshold. For this assessment, we estimated the number of facilities with actual HAP emissions at or below these analytical thresholds. Note that the EPA does not *project* that these facilities will reclassify, nor do we necessarily *expect* them to reclassify.

Selection of Illustrative Analytical Scenarios:

When considering how to characterize and analyze the impacts of the final rule, the first option is to directly apply the MST found in the definition of major source from CAA section 112.² In order to reclassify, a facility will need to reduce its HAP and PTE emissions below the MST and to maintain area source status each facility will build in a compliance margin to ensure they operate consistently below the MST. The compliance margin for each facility will be determined

¹ See *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.

² See 42 U.S.C. § 7412(a). Major source is “any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.” (The definition of area source follows as “any stationary source of hazardous air pollutants that is not a major source.”)

by the type of PTE limitations and the inherent variability from factors such as production levels and specifications, add-on control technology performance, that play a role in a source's management of operations to ensure their emissions will be below the MST consistently. The appropriate compliance margin to apply is specific to each facility and their experience operating below the MST. Some facilities may be comfortable operating 10 percent below the MST to ensure they maintain area source status. Other facilities may require a larger compliance margin of 25 or 50 percent. In addition, some facilities operating slightly above the MST may want to opt for reclassification to area source status by reducing emissions to a level below the MST. These sources are likely to conduct a break-even analysis of costs to reduce emissions and benefits of becoming an area source. Therefore, the level of actual emissions at which facilities will consider participating in the MM2A reclassification process is a continuous line from some level below the MST to a reasonable level above the MST.

For the reasons presented above and to illustrate the continuous line of actual emissions at which sources will consider participating in the MM2A reclassification process, for the MM2A illustrative analysis, we present the primary illustrative scenario, and two alternative scenarios above and below the primary illustration.³ The cost methodology described in this memorandum is applied to facilities identified under the following three illustrative analytical scenarios described in the MM2A database memo:

- Primary scenario: 75 percent of the MST (7.5 tpy of a single HAP or 18.75 tpy of all combined HAP);
- Alternative scenario 1: 50 percent of the MST (5 tpy of a single HAP or 12.5 tpy of all combined HAP); and
- Alternative scenario 2: 125 percent of the MST (12.5 tpy of a single HAP or 31.25 tpy of all combined HAP).

These three analytical thresholds are the illustrative regulatory scenarios analyzed for the final MM2A action and are described in more detail below; they represent the alternative scenarios used in the cost savings and emission analysis. While we have selected three points based on actual emissions to illustrate potential impacts of the final rulemaking, note that uncertainties exist around any specific estimate.

While different thresholds, either higher or lower, could be evaluated, the EPA selected the 75 percent of the MST as the primary scenario in this analysis. This threshold considers that facilities strive to maintain a reasonable compliance margin when meeting various types of standards, and while the analytical thresholds are not "standards," the concept is the same.⁴ In

³ These emissions thresholds represent alternative scenarios employed in the cost savings analysis to adhere to U.S. Office of Management and Budget (OMB) guidance in Circular A-4, which is guidance for analysis of economically significant rulemakings (defined in Executive Order 12866) such as this one. These three alternative scenarios were also employed in the cost savings analysis done for the proposed MM2A.

⁴ At proposal, we evaluated the types of sources that began the process of reclassification after January 2018. We reviewed permit actions related to 34 sources that had reclassified to area source status or were in the process of reclassifying as of March 2019. From March 2019 through February 2020, we learned of an additional 35 sources that had reclassified after January 2018. Of these 69 sources, we have 2017 NEI emissions data for 56. Of these 56

addition, under EPA's Stationary Source Compliance Monitoring Strategy,⁵ sources that either have potential to emit (PTE) or actually emit pollutants at or above the 80 percent of the MST are designated to have a higher level of oversight than sources that have PTE and actual emissions below 80 percent of the MST. This serves to further support our selection of the 75 percent threshold as our primary scenario. Also, for these reasons, we do not provide an estimate of cost savings at 90 percent of the MST and 100 percent of the MST (as was presented in the MM2A database memo) because for many facilities the compliance margin at these levels may be too low to ensure the area source status is maintained. However, sources in the MM2A database operating between 75 percent of the MST and 125 percent of the MST are included as part of alternative scenario 2 (the 125-percent-threshold illustrative scenario).

Some commenters suggest that the compliance margin used by the EPA in the primary scenario is too large, and the Agency should instead use a 10 percent compliance margin (i.e., present a scenario at 90 percent of the MST), but do not provide sufficient evidence that all sources in the major source program would set their compliance margin at 10 percent.⁶ As already stated, any analysis of impacts must consider the uncertainties due to the voluntary nature of this action and the numerous assumptions adopted to derive a value. An analysis at 90 percent of the MST would indicate that the Agency is confident that all sources at or below this level can maintain area source status if they opt to reclassify. To do so requires a deeper evaluation of individual facilities and their operating plans to determine their considerations for a compliance margin, which is not warranted and would not change the decision of this action.

One of the main factors determining the compliance margin needed at a facility is how rapidly emissions would change given a change in production. If the production process is at a steady state, or a batch process that can be adjusted for variability, the compliance margin could potentially be lower than 25 percent. If the production process is highly complex and cannot be adjusted quickly for variability, then a larger compliance margin would be required. Given the uncertainties associated with this analysis, the EPA is, therefore, more confident that a portrayal of sources that are currently operating with actual emissions below 75 percent of the MST would be more informative to decision makers and the public. It is for these reasons we maintain the primary scenario at 75 percent of the MST.

Note that alternative scenario 2 differs from the primary scenario and alternative scenario 1 in that facilities with emissions above major source levels would have to reduce their actual HAP

sources, 54 reported actual emissions below the major source thresholds in 2017; 52 of those 56 sources reported actual emissions below 75 percent of the MST. The analysis of these reclassifications can be found in the permit review technical support memorandum in the docket of this rulemaking.

⁵ Memorandum and attachment. From: David A. Hindin, Director, EPA Office of Compliance. To: Regional Compliance/Enforcement Division Directors. Subject: Issuance of the Clean Air Act Stationary Source Compliance Monitoring Strategy. October 4, 2016. Available at: <https://www.epa.gov/compliance/clean-air-act-stationary-source-compliance-monitoring-strategy>

⁶ The commenters also suggested that every source with actual emissions below the MST will increase emissions to the maximum level permissible as an area source (i.e., up to 10 tpy of a single HAP or 25 tpy of a combination of HAP). We discuss why this characterization of impacts is not accurate in the memorandum, *Documentation of the illustrative emissions analysis for the rule "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act"*.

emissions in order to reclassify, either by adopting controls or process modifications that reduce emissions, or by reducing production or throughput to reduce emissions. The sources in this alternative illustrative scenario would consider the cost associated with reducing emissions below the major source thresholds against the avoided costs associated with no longer having to comply with the major source NESHAP compliance requirements when deciding whether to pursue reclassification. We examine this cost consideration in our analysis of alternative scenario 2 as applied to several source categories. This analysis can be found in the memorandum titled “Analysis of the Illustrative 125% Scenario for Final MM2A – Potential Cost Impacts from HAP Major Sources Reducing Emissions as part of Reclassifying to HAP Area Sources.”⁷

3. Characterization of Affected Industries Under each Analytical Threshold Scenario

Based on the updates described in the MM2A database memo, we estimate that the major source NESHAP source categories evaluated include a total of about 7,200 facilities. Of the total major sources identified in the database, about 40 percent of facilities have emissions below the MST. Using this information, Table 3-1 lists the source categories considered in the MM2A cost savings analysis, and groups them by the number of facilities in the source category. The first column of Table 3-1 indicates whether the number of facilities with emissions below each of the emission threshold scenarios was estimated from the RTR modeling file/NEI data, or whether it was extrapolated based on the analysis of other source categories with RTR data that shared the same 3-digit NAICS code. We also segment the source categories as follows: (1) source categories with fewer than five facilities total, (2) source categories with more than 5 facilities but fewer than 40 total, (3) and those with 40 or more facilities in the source category.

Table 3-1. Source Categories Grouped by the Number of Facilities.

Type of Data Used to Estimate Facilities Below Thresholds	Source Category	Total Major Source Facilities in Source Category	Number of Facilities with Emissions Below Each Scenario Threshold		
			50% of the MST (Alternative Scenario 1)	75% of the MST (Primary Scenario)	125% of the MST (Alternative Scenario 2)
Source Categories with Fewer than Five Facilities					
RTR	Acetal Resins	3	0	0	0
RTR	AMF (Acrylic/Modacrylic Fibers)	1	0	0	0
Extrapolated	Clay Ceramics Manufacturing	3	1	1	2
RTR	Ferroalloys	2	0	0	0
RTR	Friction	2	0	0	0
RTR	Hydrogen Fluoride	2	0	0	0

⁷ U.S. EPA. Memorandum from Larry Sorrels, U.S. EPA to EPA Docket No. EPA-HQ-OAR-2019-0282. “Analysis of Illustrative 125% Scenario for Final MM2A – Potential Cost Impacts from HAP Major Sources Reducing Emissions as part of Reclassifying to HAP Area Sources.” June 2020.

Type of Data Used to Estimate Facilities Below Thresholds	Source Category	Total Major Source Facilities in Source Category	Number of Facilities with Emissions Below Each Scenario Threshold		
			50% of the MST (Alternative Scenario 1)	75% of the MST (Primary Scenario)	125% of the MST (Alternative Scenario 2)
RTR	Leather	4	2	2	3
Extrapolated	Magnetic Tape	0	0	0	0
Extrapolated	Mercury Cell Chlor-Alkali Plants	1	0	0	0
RTR	Nutritional Yeast	4	0	0	0
RTR	Polycarbonates	4	0	1	1
Extrapolated	Primary Copper	0	0	0	0
RTR	Primary Lead	1	0	0	0
Extrapolated	Primary Magnesium Refining	1	0	0	0
Extrapolated	PVC	4	1	1	2
Source Categories with Five or More Facilities, But Fewer than 40 Facilities					
RTR	Aerospace - federal government owned	36	23	26	29
RTR	Asphalt	8	2	2	2
Extrapolated	Carbon Black (GMACT II)	16	4	5	6
Extrapolated	Cellulose Products Manufacturing	11	0	0	0
Extrapolated	Coke Ovens: Charging, Top Side, and Door Leaks	22	0	0	0
Extrapolated	Coke Ovens: Pushing, Quenching, & Battery Stacks	17	0	0	0
RTR	Ethylene Production	32	0	0	0
Extrapolated	Flexible Foam Fabrication	5	2	2	3
RTR	Flexible Foam Production	12	11	11	11
RTR	HCl Production	19	4	4	5
Extrapolated	Industrial Cooling Towers	33	7	9	12
RTR	Integrated Iron and Steel	12	0	0	0
RTR	Large Appliances	10	6	7	7
RTR	Lime Manufacturing	35	0	0	0
RTR	Metal Can	5	2	3	4
RTR	Metal Furniture	16	9	10	14
RTR	Mineral Wool	7	1	2	2
RTR	OSWRO	38	17	21	25
RTR	P&R I (7 Source Categories)	18	1	1	1

Type of Data Used to Estimate Facilities Below Thresholds	Source Category	Total Major Source Facilities in Source Category	Number of Facilities with Emissions Below Each Scenario Threshold		
			50% of the MST (Alternative Scenario 1)	75% of the MST (Primary Scenario)	125% of the MST (Alternative Scenario 2)
RTR	P&R II (2 Source Categories)	7	2	2	2
RTR	P&R III	19	5	5	7
RTR	P&R IV (5 Source Categories)	31	1	2	4
RTR	PAI (Pesticide Active Ingredient Production)	18	2	4	5
RTR	PEPO (Polyether Polyols Production)	23	6	7	7
RTR	Pharmaceuticals	26	2	6	8
RTR	Phosphate Fertilizer	11	0	0	0
RTR	Phosphoric Acid	12	0	0	0
RTR	POTW	10	6	7	7
RTR	Primary Aluminum	13	0	1	1
Extrapolated	Refractory Products Manufacturing	8	3	3	4
Extrapolated	Rubber Tire Manufacturing	21	7	10	12
Extrapolated	Semiconductor Manufacturing	23	11	13	15
Extrapolated	Spandex (GMACT II)	5	0	0	0
RTR	Taconite Iron Ore Processing	8	0	0	0
RTR	Wet Formed Fiberglass Mat	7	2	4	5
Source Categories with 40 or More Facilities					
RTR	Aerospace - Privately Owned	108	83	92	95
RTR	Auto and Light Duty Truck	43	2	5	13
RTR	Boat Manufacturing	93	15	24	33
RTR	Brick	74	41	47	55
Extrapolated	Cyanide Chemicals (GMACT II)	80	0	0	0
RTR	Engine Test Cells/Stands	59	25	26	28
RTR	Fabric	43	22	24	27
Extrapolated	Gasoline Distribution (Stage 1)	187	27	32	36
Extrapolated	Hazardous Organic NESHAP	365	94	115	147

Type of Data Used to Estimate Facilities Below Thresholds	Source Category	Total Major Source Facilities in Source Category	Number of Facilities with Emissions Below Each Scenario Threshold		
			50% of the MST (Alternative Scenario 1)	75% of the MST (Primary Scenario)	125% of the MST (Alternative Scenario 2)
Extrapolated	ICI Boilers and Process Heater (3 source categories)	1821	545	687	814
RTR	Iron and Steel Foundries (Major Sources)	45	0	0	0
RTR	Marine Vessel Loading	152	85	90	99
RTR	Metal Coil	48	31	35	36
RTR	Misc. Metal Parts	368	200	233	281
RTR	Miscellaneous Coating Manufacturing	43	16	17	24
RTR	Miscellaneous Organic Chemical Manufacturing (MON)	197	22	28	45
Extrapolated	Natural Gas Transmission	83	27	33	40
Extrapolated	Oil and Gas	106	35	42	51
RTR	Organic Liquids Distribution (Non-Gasoline) (OLD)	178	53	57	65
RTR	Paper and Other Web Coatings: Surface Coating	171	46	55	68
RTR	Plastic Parts	125	38	53	67
RTR	Plywood and Composite Wood Products	233	13	25	82
RTR	Printing and Publishing	172	91	101	112
Extrapolated	Pulp & Paper (non-combust) MACT	114	0	0	0
RTR	Pulp and Paper Combustion Sources	109	0	0	0
RTR	Refineries (2 Source Categories)	142	20	24	27
RTR	Reinforced Plastic Composites	449	134	180	236
RTR	Secondary Aluminum	52	5	6	7
RTR	Shipbuilding	84	16	50	62
RTR	Site Remediation	102	20	21	26
RTR	Steel Pickling	51	35	37	42
Extrapolated	Utility Boilers	193	0	0	0
RTR	Vegetable Oil	88	1	2	2
RTR	Wood Building Products	50	26	30	31

Type of Data Used to Estimate Facilities Below Thresholds	Source Category	Total Major Source Facilities in Source Category	Number of Facilities with Emissions Below Each Scenario Threshold		
			50% of the MST (Alternative Scenario 1)	75% of the MST (Primary Scenario)	125% of the MST (Alternative Scenario 2)
RTR	Wood Furniture	333	201	224	252

4. Cost Analysis

If a source voluntarily chooses to reclassify to area source status, upon reclassification they will no longer be subject to applicable major source NESHAP and will no longer have the major source NESHAP compliance costs. For the most part, the savings from no longer having to comply with a major source NESHAP relates to monitoring, recordkeeping, and reporting requirements for major sources. However, a reclassified source may have area source NESHAP compliance costs if the facility is subject to an applicable area source NESHAP. Costs associated with an area source rule may include different emissions control requirements, along with monitoring, recordkeeping, and reporting requirements. Facilities will also incur costs to obtain limits on the facility’s potential to emit (PTE) and modify the facility’s operating permit to remove major source NESHAP provisions and add newly applicable area source NESHAP provisions. To modify an operating permit under this action, owners or operators will be required to collect data and demonstrate that they qualify for consideration of status change from major or area source status. They will prepare an application and submit the request to the permitting authority and respond to any inquiries regarding the permit modification request. Overall, it is expected that the sum of costs and cost savings of actions taken to reclassify from major source to area source status in the long run will be a net annual cost savings.

It is difficult, if not impossible to predict whether any facility will choose to reclassify in response to MM2A rulemaking. The decision made by each facility will depend on facility-specific factors and factors that are also likely to be specific to a given source category.

For the cost savings analysis, we are estimating the costs associated with the number of facilities indicated in Table 3-1. These facility counts in Table 3-1 are likely to represent the maximum number of facilities that could seek to reclassify at each of these analytical thresholds, and not the actual number that would reclassify. Most facilities that reclassify would do so only if they were able to maintain a reasonable compliance margin between actual emissions and their limitations on the potential to emit HAP emissions below the MST still provide margin that would allow for a reasonable amount of operating flexibility to allow for increased production or throughput when needed.

A. Elements of the Cost Analysis

The cost savings analysis for MM2A includes three main estimated cost elements.

- The first is the cost associated with obtaining PTE limitations and modifying the existing operating permit issued under 40 CFR part 70 or part 71 for the facility to remove the major source NESHAP requirements and include any relevant area source NESHAP requirements and/or limits on PTE.
- The second is the cost savings from no longer having to comply with the major source NESHAP (i.e., the deregulatory cost savings).
- The third is the new cost of complying with the relevant area source NESHAP requirements.

These main cost elements, and other costs and uncertainties are discussed in the following sections 4.A.1 through 4.A.3 of this memo.

A.1. Costs Associated with a Reclassification Permit Application

For the final rule analysis, we used the costs associated with obtaining a Minor New Source Review (NSR) Permit, as a surrogate for estimating the costs associated with obtaining a permit limiting the PTE below MST. We also use the permitting costs associated to an Administrative Amendment under 40 CRR part 70 as a surrogate of the costs associated with modifying a facility's existing operating permit issued under 40 CFR part 70 or part 71 to remove the major source NESHAP requirements and include any relevant area source NESHAP requirements. We used inputs from the same minor NSR permitting process and Administrative Amendment permit process to estimate the cost incurred by a S/L/T permitting agency to review and process those permit modifications. These permitting costs are summarized in Table 4-1.

The minor NSR permit was selected as the basis for estimating the permitting costs for a source to reclassify because most sources will rely on existing minor source programs like minor NSR as the mechanism to obtain PTE limitations in order to reclassify.⁸ Any permit mechanism used to reclassify to area source status will require similar information and process as the minor NSR.

⁸ We expect that the process for reclassification to area source status for HAP will rely on existing programs (e.g., minor source programs, title V permitting procedures, and/or approved programs for issuing PTE limits under CAA section 112(l)).

Table 4-1. Permitting Cost Inputs Used in the Final Rule Cost Savings Analysis

Cost Item	The hours and costs to be used in the final rule:	Costs Adjusted to 2017 Dollars
Burden for sources for obtaining an area source permit	40 hours @ \$87/hr = \$3,480 ⁹ (2016\$)	\$3,545.42
Burden for sources for administrative amendment or rescission of a major source operating permit	8 hours @ \$66/hr = \$528 ¹⁰ (2014\$)	\$543.47
Total one-time facility permitting burden estimate per facility		\$4,089 (2017\$)
Burden for agency for granting an area source permit	30 hours @ \$63/hr = \$1,890 ¹¹ (2016\$)	\$1,925.53
Burden for agency for rescission of a major source permit	5 hours @ \$53/hr = \$265 ¹² (2016\$)	\$269.98
Total one-time State agency burden estimate per facility		\$2,196 (2017\$)

As is discussed in the MM2A database memo, all costs and emissions are presented relative to the year 2017. Therefore, the costs in Table 4-1 were adjusted from 2014 and 2016 dollar values to 2017 dollar values using the Gross Domestic Product: Implicit Price Deflator, which can be found at: <https://fred.stlouisfed.org>. The index is based on the value for 2012 being equal to 100, and it is seasonally adjusted and based on Federal Reserve economic data. The data were adjusted as follows using the GDP inflator.

To adjust from 2014 to 2017:

GDP inflator 2017/GPD inflator 2014 = 107.78875/103.63325 = 1.0293. We updated the 2014\$ costs to 2017\$ by multiplying by this amount.

To adjust from 2016 to 2017:

GDP inflator 2017/GPD inflator 2016 = 107.78875/105.798 = 1.0188. We updated the 2016\$ costs to 2017\$ by multiplying by this amount.

In the analysis for the proposed MM2A rule, to estimate the permitting costs associated to the reclassification of sources, EPA used the burden estimate for minor tribal NSR permits instead of the minor NSR permit. For the final rule analysis, EPA is making a technical correction to the

⁹ Supporting Statement for Prevention of Significant Deterioration and Nonattainment New Source Review, EPA Tracking No. 1230.32, OMB Control No. 2060-0003. November 2016, Table 6-1, activity III.A, Minor NSR – State/Local and Indian Country Programs - Preparation and submittal of registrations and permit applications.

¹⁰ Supporting Statement for The Part 71 Federal Operating Permit Program (Renewal), EPA Tracking # 1713.11, OMB Control # 2060-0336, May 18, 2015, Table 6, activity for “Administrative Amendments.”

¹¹ Id., Table 6-2, activity item III, Preparation and issuance of Minor NSR Permits.

¹² Id., Table 7, activity for “Administrative Amendments.”

analysis conducted at proposal by using the minor NSR rather than minor tribal NSR burden estimates because most sources of the sources in our analysis are located outside of tribal lands and the minor NSR costs better represent the costs sources likely to incur to reclassify.¹³

A.2. Deregulatory Cost Savings for Facilities That Reclassify from Major Source to Area Source Status

To estimate the cost savings of not having to comply with a major source NESHAP, for each source category, the EPA reviewed the supporting statement in the most recent Office of Management and Budget (OMB)-approved information collection request (ICR) to determine the burden in terms of average costs per facility for recordkeeping and reporting labor, and costs for operation and maintenance (O&M) for monitoring systems for the compliance requirements for the major source NESHAP regulating that source category.¹⁴ The ICRs the EPA reviewed are listed in Appendix 1.

The estimated capital costs of emission control equipment (e.g., add-on controls), process changes, and formulations associated with major source NESHAP were considered to be sunk costs and were not included in the cost savings estimates.

The projected cost savings per source category is the product of the number of facilities eligible to obtain area source status from Table 3-1 multiplied by the average burden (i.e., labor costs, and operation and maintenance costs) per facility from the ICR supporting statement (in that source category).

A.3. Costs Associated with Applicable Area Source Requirements

To estimate the compliance cost for facilities if they obtain area source status, we used the burden estimated for an area source NESHAP for comparable source categories. If no comparable area source rule was available for a major source category, the weighted-average area source cost per existing facility (\$1,787) was used as a default, and represents the burden associated with complying with limits on the facility's potential to emit that are likely to be applied to the operating permit upon reclassification. The weighted-average was developed from the compliance costs and the number of facilities in the source categories for Chemical Manufacturing Area Sources (CMAS, subpart VVVVVV), Nine Metal Fabrication and Finishing Area Source Categories (subpart XXXXXX), Acrylic and Modacrylic Fibers (AMF, subpart LLLLLL), Flexible Polyurethane Foam Production and Fabrication (OOOOOO), Gasoline Distribution MACT and GACT (subpartsBBBBBB and CCCCCC), Publicly Owned Treatment Works (POTW, subpart VVV), Secondary Aluminum (subpart RRR), and Wood Furniture (subpart JJ).

¹³ After evaluation of the sources that have reclassified after January 2018, EPA determined that most of the sources are not located in tribal lands.

¹⁴ The OMB-approved ICR is an estimate by the EPA of the recordkeeping and reporting burden associated with complying with a regulation. The burden estimate is required under the Paperwork Reduction Act of 1995 (Pub. L. 104-13) and must be updated and re-approved by OMB every three years.

The estimated area source compliance cost value used for each source category is listed in Table 4-2.

Table 4-2. Estimated Area Source Compliance Cost Per Facility (by Source Category).

Source Category	Applied Cost for Area Source Compliance: per Existing Source (2017\$)*	Source of Area Source Cost Estimate
Acetal Resins	\$2,186	CMAS
Aerospace - federal government owned	\$747	Subpart XXXXXX
Aerospace - Privately Owned	\$747	Subpart XXXXXX
AMF (Acrylic/Modacrylic Fibers)	\$977	AMF
Asphalt	\$1,787	Weighted-Average
Auto and Light Duty Truck	\$747	Subpart XXXXXX
Boat Manufacturing	\$1,787	Weighted-Average
Brick	\$1,787	Weighted-Average
Engine Test Cells/Stands	\$1,787	Weighted-Average
Ethylene	\$1,787	Weighted-Average
Fabric	\$747	Subpart XXXXXX
Ferrous Alloys	\$1,787	Weighted-Average
Flexible Foam Production	\$513	Flexible Foam Production
Friction	\$1,787	Weighted-Average
GMACT-HF	\$1,787	Weighted-Average
HCl Production	\$2,186	CMAS
Integrated Iron and Steel	\$1,787	Weighted-Average
Iron and Steel Foundries (Major Sources)	\$1,787	Weighted-Average
Large Appliances	\$747	Subpart XXXXXX
Leather	\$747	Subpart XXXXXX
Lime Manufacturing	\$1,787	Weighted-Average
Marine Vessel Loading	\$1,787	Weighted-Average
Metal Can	\$747	Subpart XXXXXX
Metal Coil	\$747	Subpart XXXXXX
Metal Furniture	\$747	Subpart XXXXXX
Mineral Wool	\$1,787	Weighted-Average
Misc. Metal Parts	\$747	Subpart XXXXXX
Miscellaneous Coating Manufacturing	\$2,186	CMAS
Miscellaneous Organic Chemical Manufacturing (MON)	\$2,186	CMAS
Natural Gas Transmission	\$1,787	Weighted-Average

Source Category	Applied Cost for Area Source Compliance: per Existing Source (2017\$)*	Source of Area Source Cost Estimate
Nutritional Yeast	\$1,787	Weighted-Average
Oil and Gas	\$1,787	Weighted-Average
Organic Liquids Distribution (Non-Gasoline) (OLD)	\$7,427	Subpart BBBBBB, CCCCCC
OSWRO	\$1,787	Weighted-Average
P&R I (7 Source Categories)	\$2,186	CMAS
P&R II (2 Source Categories)	\$2,186	CMAS
P&R III	\$2,186	CMAS
P&R IV (5 Source Categories)	\$2,186	CMAS
PAI (Pesticide Active Ingredient Production)	\$2,186	CMAS
Paper and Other Web Coatings: Surface Coating	\$747	Subpart XXXXXX
PEPO (Polyether Polyols Production)	\$2,186	CMAS
Pharmaceuticals	\$2,186	CMAS
Phosphate Fertilizer	\$1,787	Weighted-Average
Phosphoric Acid	\$1,787	Weighted-Average
Plastic Parts	\$747	Subpart XXXXXX
Plywood and Composite Wood Products	\$1,787	Weighted-Average
Polycarbonates	\$2,186	CMAS
POTW	\$27	POTW
Primary Aluminum	\$1,787	Weighted-Average
Primary Lead-facility closed	\$1,787	Weighted-Average
Printing and Publishing	\$747	Subpart XXXXXX
Pulp and Paper Combustion Sources	\$1,787	Weighted-Average
Refineries (2 Source Categories)	\$2,186	CMAS
Reinforced Plastic Composites	\$1,787	Weighted-Average
Secondary Aluminum	\$5,563	Secondary Aluminum
Shipbuilding	\$747	Subpart XXXXXX
Site Remediation	\$1,787	Weighted-Average
Steel Pickling	\$1,787	Weighted-Average
Taconite Iron Ore Processing	\$1,787	Weighted-Average
Turbines	\$1,787	Weighted-Average
Vegetable Oil	\$1,787	Weighted-Average
Wet Formed Fiberglass Mat	\$1,787	Weighted-Average

Source Category	Applied Cost for Area Source Compliance: per Existing Source (2017\$)*	Source of Area Source Cost Estimate
Wood Building Products	\$747	Subpart XXXXXX
Wood Furniture	\$1,511	Wood Furniture ¹⁵

* The GDP inflator was used to adjust the values for different years in the ICRs to 2017 dollars. The GDP inflator data can be found at <https://fred.stlouisfed.org>.

The estimated cost of the area source requirements is the product of the number of facilities with emissions below the emissions threshold in a scenario multiplied by the estimated area source rule burden for that source category.

B. Exceptions to the Overall Cost Savings Approach Described Above

Four different groups of source categories that were treated differently from those described above for which the EPA had developed RTR modeling files, for the reasons explained below:

- Source categories for which the EPA had not yet developed RTR modeling files;
- Reciprocating Internal Combustion Engines (RICE);
- Industrial Process Cooling Towers; and
- Industrial, Commercial, And Institutional Boilers and Process Heaters.

The results of the analysis for each group of source categories in Appendices 2-4 of this memo are presented as the total results for each of the three alternative scenarios analyzed.

Source categories for which the EPA had not yet developed RTR modeling files:

For each source category for which EPA did not have an RTR modeling file, we summed the projected cost savings in year 1 for the source categories with RTR data that were matched by NAICS code to the category being evaluated. This was then divided by the number of facilities in the matching NAICS code to obtain the average cost savings in year 1 per facility. The same was done for the cost savings in year 2. These were then multiplied by the estimated number of facilities that would be eligible to obtain area source status in each of the categories for which EPA did not have RTR data to determine the cost savings for each category.

The EPA used this approach for all source categories except the source categories for reciprocating internal combustion engines and for industrial process cooling towers. The approach for these two source categories is discussed in the next two sections.

¹⁵ The Wood Furniture NESHAP (40 CFR subpart JJ) applies to major sources and there is no separate rule for area sources. However, subpart JJ includes minimal recordkeeping requirement for sources to demonstrate that they are not major sources, but they are not subject to any emission reduction requirements. The estimated annual cost is \$1,457 per facility, based on the information collection request supporting statement.

Reciprocating Internal Combustion Engines (RICE)

The EPA developed a list of facilities in the Reciprocating Internal Combustion Engine (RICE) source category by downloading from ECHO the data for major source facilities subject to 40 CFR 63, subpart ZZZZ, the NESHAP for Reciprocating Internal Combustion Engines.

Using the NAICS code for each facility from ECHO, the list of facilities was grouped so we had a count of the number of facilities at the 3-digit NAICS code.

For each 3-digit NAICS, we used the fraction of sources that were estimated to obtain area source status from the source categories for which the EPA had RTR data. If there was no match, then a default value based on all NAICS was used.

For each 3-digit NAICS code, we then estimated the number of facilities that would be eligible to obtain area source status in each threshold scenario.

Because subpart ZZZZ regulates both major and area sources and the compliance requirements are similar for RICE at major and area sources, we assumed no cost savings for RICE located at major source facilities that obtain area source status. Although it is expected that these facilities would see some savings, we do not currently have enough detailed data to quantify those savings. However, we estimated costs for Year 1 to obtain area source permits as a facility permit cost and a state permit cost. No costs or savings were estimated for subsequent years. The results of the analysis for the RICE source category are included in the tables in Appendices 2 through 4. However, the permitting costs for RICE were not included in the total permitting costs for all source categories.

Industrial Process Cooling Towers

The EPA developed a list of facilities with industrial process cooling towers by downloading data from ECHO for major source facilities subject to 40 CFR subpart Q NESHAP for Industrial Process Cooling Towers. Nearly all 286 facilities in ECHO with an industrial process cooling tower are subject to another NESHAP because these are not standalone emission sources and they are present to cool another industrial process subject to another NESHAP.

The EPA matched almost all facilities at the 6-digit NAICS code to the NAICS code associated with another major source NESHAP. For these facilities, the EPA assumed that any cost savings would be reflected in the cost savings associated with the primary NESHAP and there would be no separate cost savings for just the process cooling tower.

Only 27 facilities could not be associated with another NESHAP based on the 6-digit NAICS code reported for the facility in ECHO. For these 27 facilities, we estimated the fraction that would be eligible to obtain area source status based on the 3-digit NAICS code, matched to those source categories for which the EPA had RTR data.

The cost savings in the first and subsequent years, per facility, were assumed to be the same as the average per facility for those for which the EPA had RTR data, based on the 3-digit NAICS code. These cost savings were used to estimate the total cost savings for the 27 facilities with

process cooling towers that could not be matched to another NESHAP based on their 6-digit NAICS.

However, three of the 27 facilities could not be matched to a 3-digit NAICS for which EPA had RTR data. These three were universities. For these three facilities, the number that were estimated to be eligible to obtain area source status was based on the overall fraction of facilities in all categories for which there are RTR modeling files and which could obtain area source status, which is 40 percent. The results of the analysis for the 27 industrial process cooling towers not associated with another major source NESHAP are included in the tables in Appendices 2 through 4, with the other source categories for which the EPA did not have RTR modeling data files.

Industrial, Commercial, And Institutional Boilers and Process Heaters

The EPA developed a list of facilities in the Industrial, Commercial, And Institutional Boilers and Process Heaters (ICI Boilers) source category by downloading from ECHO the data for major source facilities subject to 40 CFR 63, subpart DDDDD, the NESHAP for Industrial, Commercial, And Institutional Boilers and Process Heaters. From these downloaded data, we removed facilities that were identified as actually being in the electricity generating unit (EGU) source category and also ICI boilers that had switched to natural gas, because these two classes of boilers would not be subject to subpart DDDDD. These changes were based on information from the EPA source category project lead and an inventory of the EGU source category.

Using the NAICS code for each facility from ECHO, the list of remaining facilities was grouped so we had a count of the number of facilities at the 3-digit and 6-digit NAICS code.

We then estimated the number of facilities in each NAICS code that would be in the following facility type categories using the percentages provided in parentheses:

- Large solid-fueled or liquid-fueled units (11 percent of facilities)
- Small solid-fueled or liquid-fueled units (3 percent of facilities)
- Only have large gas-fueled units (33 percent of facilities)
- Only have small gas-fueled units (53 percent of facilities)

The fractions are from the ICR for subpart DDDDD.

For each 3-digit NAICS, we used the fraction of sources that were estimated to be eligible to obtain area source status from the source categories for which the EPA had RTR data. If there was no match, then a default value based on all NAICS was used.

For each facility type and 3-digit NAICS combination, we then estimated the number of facilities that would be eligible to obtain area source status.

For each facility type, the subpart DDDDD ICR estimated current operation and maintenance costs to comply per facility. The ICR for the area source rule, subpart JJJJJ, NESHAP for Industrial, Commercial, and Institutional Boilers at Area Sources, provided the new operation and maintenance costs for facilities that are eligible to obtain area source status. The difference

in these two costs was the annual cost savings for the facilities that are eligible to obtain area source status.

We also estimated the permitting costs for the facilities and the states in Year 1.

The projected cost savings in years 2 through 5 was the cost difference for facilities that could obtain area source status between complying with subpart DDDDD and subpart JJJJJ.

The results of the analysis for the industrial, commercial, and institutional boilers and process heaters are also included in the tables in Appendices 2 through 4.

C. Cost to Reduce Emissions Under Alternative Scenario 2

As mentioned earlier in Section 2 of this memo, we analyze in another memo the potential for source categories with major sources of emissions up to 125 percent of the HAP emissions thresholds to reduce emissions as part of reclassifying to area source status. We then present by source category the net annual cost savings (cost savings under alternative scenario 2 - costs to reduce emissions) from reducing HAP emissions. This illustrative cost 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 control costs associated with the reduction of HAP emissions sufficient for sources with emissions of up to the 125 percent of the MST to reach 100 percent of the MST. We find that there are four source categories with sources with emissions of up to the 125 percent of the MST for which control technologies or techniques are available to reduce HAP emissions if their sources choose to reclassify. Of those source categories, three (MON, OLD, and Wood Furniture) are estimated to have cost savings from potential reclassification net of their control costs, while one (Marine Vessel Loadings) would not have cost savings net of control costs.¹⁶

Results of this analysis are not meant to serve as representative of impacts for all source categories potentially affected under alternative scenario 2. This analysis is not applicable to sources at the other two scenarios examined in this final action (alternative scenario 1 and the primary scenario).

5. Total MM2A Cost Impacts

A. Summation of Costs in the Initial Year and in Years After Reclassification

The results for the illustrative net costs (or savings) in the first year (Year 1) after major source facilities obtain area source status is estimated to be the sum of the permitting costs to the facilities and the permitting costs to the state agencies for processing the reclassifications. That is, these are the cost for each facility to apply for and obtain an area source or synthetic minor permit, and for the state agencies to review and approve those permit applications and issue the

¹⁶ U.S. EPA. Memorandum from Larry Sorrels, U.S. EPA to EPA Docket No. EPA-HQ-OAR-2019-0282. "Analysis of Illustrative 125% Scenario for Final MM2A – Potential Cost Impacts from HAP Major Sources Reducing Emissions as part of Reclassifying to HAP Area Sources." June 2020.

permits. The permitting cost to the facilities and the permitting costs to the state agencies are one-time costs and occur only in Year 1 when a facility reclassifies.

The results for the illustrative net costs (or savings) in the year after major source facilities obtain area source status (Year 2 and beyond) is estimated to be the sum of the projected annual costs savings from not having to comply with the major source rule MRR requirements, and the estimated costs of compliance with the area source rule requirements. These projected savings are expected to continue each year beyond the second year for there is no time specified for review of this action under the Clean Air Act. The permitting costs to the facilities and the permitting costs to the state agencies are not included in the second year because it is assumed the permitting changes are all completed in the first year and no action is needed in the second year.¹⁷

Table 5-1 presents the composite of results of the illustrative net costs (savings) for the first year (Year 1) and the second and all subsequent years (Year 2) after major source facilities obtain area source status for the three illustrative threshold scenarios.

¹⁷ This analysis also does not account for any potential savings from facilities no longer having to have a Title V permit and no longer having to pay emissions-based fees for part 70 (Title V) permit programs.

Table 5-1. Composite Net Costs (Savings) for Year 1 and Year 2 (and subsequent years)

Summary for Alternative Scenario 1 (50% of the MST)

Coverage	Number of Source Categories	Total Number of Facilities in Source Categories subject to Major Source NESHAP	Number of Facilities Below the Illustrative Threshold Scenario	Percentage of Facilities Below the Illustrative Threshold Scenario (%)	Potential Net Cost Savings (2017\$) Year 1	Potential Net Cost Savings (2017\$) Year 2
Source Categories with RTR data	74	4,068	1345	33.06%	\$8,456,272	(\$46,242,063)
All Other Source Categories (22 extrapolated categories plus oil and gas production, natural gas transmission and storage)	24	1,294	219	16.92%	\$1,377,642	(\$7,464,412)
ICI Boilers and Process Heaters (3 categories)	3	1,821	545	29.93%	\$3,426,519	(\$20,101,369)
All Source Categories	101	7,183	2,109	29.36%	\$13,260,432	(\$73,807,843)

Summary for the Primary Scenario (75% of the MST)

Coverage	Number of Source Categories	Total Number of Facilities in Source Categories subject to Major Source NESHAP	Number of Facilities Below the Illustrative Threshold Scenario	Percentage of Facilities Below the Illustrative Threshold Scenario (%)	Potential Net Cost Savings (2017\$) Year 1	Potential Net Cost Savings (2017\$) Year 2
Source Categories with RTR data	74	4,068	1614	39.68%	\$10,147,526	(\$56,137,515)
All Other Source Categories (22 extrapolated categories plus oil and gas production, natural gas transmission and storage)	24	1,294	266	20.56%	\$1,680,049	(\$9,030,684)
ICI Boilers and Process Heaters (3 categories)	3	1,821	687	37.73%	\$4,319,300	(\$25,456,533)
All Source Categories	101	7,183	2,567	35.74%	\$16,146,875	(\$90,624,732)

Summary for Alternative Scenario 2 (125% of the MST)

Coverage	Number of Source Categories	Total Number of Facilities in Source Categories subject to Major Source NESHAP	Number of Facilities Below the Illustrative Threshold Scenario	Percentage of Facilities Below the Illustrative Threshold Scenario (%)	Potential Net Cost Savings (2017\$) Year 1	Potential Net Cost Savings (2017\$) Year 2
Source Categories with RTR data	74	4,068	1965	48.30%	\$12,354,330	(\$68,736,482)
All Other Source Categories (22 extrapolated categories plus oil and gas production, natural gas transmission and storage)	24	1,294	330	25.50%	\$2,068,885	(\$11,528,826)
ICI Boilers and Process Heaters (3 categories)	3	1,821	814	44.70%	\$5,117,773	(\$30,740,964)
All Source Categories	101	7,183	3,109	43.28%	\$19,540,989	(\$111,006,272)

Note: Net cost savings presented for Year 2 (and all subsequent years) represents the illustrative net costs (or savings) in the year after major source facilities obtain area source status, which are expected to continue each year beyond the second year.

B. Distribution of Regulatory Cost Impacts Across Time

In the proposal MM2A analysis, we estimated that all potential reclassifications that could occur as a result of the rulemaking would take place within one year of promulgation of the final rule. Thus, in our proposed illustrative analysis all potential reclassifications would take place by 2021. In our proposal analysis, we assumed that the net cost savings in 2021 would be the sum of the costs to reclassify (i.e., the costs to revise permits to remove major source NESHAP requirements, and to add limits on potential to emit and area source NESHAP requirements), and the net cost savings from not having to comply with a major source NESHAP, and only having to comply with an area source NESHAP (if applicable). We assumed that the net cost savings in 2022 would be the net cost savings from not having to comply with a major source NESHAP, and only having to comply with an area source NESHAP (if applicable). The approach used in our proposal analysis showed net cost savings in both 2021 and 2022, with greater net cost savings in 2022 than in 2021.

We did not use the same approach for the final rule analysis. Based on the number of potential reclassifications discussed in this analysis, we can confidently conclude that not all of the reclassifications will occur in the first year after the rule is issued, as we had assumed at proposal. There are a limited number of hours in a year by which these reclassifications can be processed and determinations can be issued as final actions. The timing of a reclassification is influenced by several considerations including: time for facilities to determine whether it is in their best interests to reclassify, time to prepare applications for reclassification, and time for permitting authorities to review applications and process reclassification requests. There is also time allotted for the EPA to review determinations by permitting authorities (i.e., for Title V operating permit renewals), and for public participation in the process.

The process to apply and complete a reclassification action will depend on the particulars of each source and the permit mechanism used to reclassify.

To complete the reclassification process for a particular source, there is likely to be a portion of time allotted across multiple individuals at industrial facility, at permitting authority, at EPA, and from the public. It will likely require several employees at the facility, working a portion of their time, to prepare the reclassification/permit application, several staff at the permitting authority working a portion of their time among their assigned tasks to complete the reviews and process reclassification permits, and, and several employees at the EPA to review determinations, as well as several individuals in the public to monitor and comment on the process. Based on ICRs for the Minor NSR permit program and Title V administrative amendment, EPA estimates an average of 83 burden hours per facility to apply and complete area source applications (48 burden hours incurred by the source and 35 burden hours incurred by the regulatory/permitting agency).

In addition, we are aware that some reclassification requests may not be submitted until one or more years after the MM2A rule is promulgated, because facilities may need time to decide whether to pursue a reclassification. For example, they may need time to weigh the relative merits of reclassifying, to conduct analysis and to modify their equipment and/or operations before they are ready (or eligible) to seek a reclassification.

We can infer some knowledge from the reclassification actions that have been finalized since the issuance of the 2018 MM2A memorandum. We evaluated the types of sources that completed the process of reclassification between January 2018 and January 2020. At proposal, we reviewed permit actions related to 34 sources that have reclassified to area source status after January 2018. We received an additional 34 reclassification permits after the rule was proposed. In total, we know that at least 68 reclassification permits were processed over a 2-year period.

Our permit review shows that once the source submits a complete application to its regulatory authority, the time to process and finalize the action can vary. It can take an average of one month for a revocation letter to be issued (for a source that has an existing enforceable PTE HAP limitations or is a true area source), three to seven months for a minor source permit to be issued (source that is getting enforceable PTE HAP limitations), or up to a year if the reclassification is part of a Title V renewal (more complex sources that are still required to have Title V permit after reclassification). Some of the future reclassifications may be more complex and require more time by all parties to finalize.

Again, all of these aspects of the process are specific to the source and the permitting authority issuing the final action. Any action taken by a source in response to the MM2A rule is voluntary and will continue in perpetuity under the CAA section 112 air toxics program. Given these considerations, it is reasonable to assume that not all the reclassifications will occur within one year after the MM2A rule is finalized and instead the reclassifications assessed in the cost analysis will occur over some extended period of time. To illustrate the cost impact of the policy, we present both the impacts if all reclassifications occur in a single year (i.e., the Year 1 and Year 2 estimates provided in Table 5-1), and a 5-year outlook that assumes all sources included in the facility count of Table 3-1 will reclassify in that timeframe and assumes the reclassifications are evenly distributed over the years.

Thus, in our final illustrative analysis, potential reclassifications will be complete by the end of 2024. This would be the case for all scenarios included in the analysis. We also presume that all sources in the MM2A database with emissions below the MST will voluntarily choose to reclassify and incur the estimated costs.

To illustrate the cost impact of the policy, we present both the impacts if all reclassifications occur in a single year (i.e., the Year 1 and Year 2 estimates provided in Table 5-1), and a 5-year outlook that assumes all sources included in the facility count of Table 3-1 will reclassify in that timeframe and assumes the reclassifications are evenly distributed over the years.

As a result, the total costs in each year from this action are calculated as follows:

2021 costs = Year 1 x 0.25

2022 costs = (Year 1 x 0.25) + (Year 2 x 0.25)

2023 costs = (Year 1 x 0.25) + (Year 2 x 0.50)

2024 costs = (Year 1 x 0.25) + (Year 2 x 0.75)

2025 (and beyond) costs = Year 2 in total

Table 5-2 displays the summation of costs by year from 2021 to 2025 and all subsequent years. The results of the analysis for the source categories with detailed RTR modeling data files are included in the tables in Appendices 2 through 4.

Table 5-2. Total MM2A Cost Savings Over Time

Coverage	Number of Source Categories	Total Number of Facilities in Source Categories subject to Major Source NESHAP	Number of Facilities below the Illustrative Threshold Scenario	Percentage of Facilities below the Illustrative Threshold Scenario (%)	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Costs Over a 5-Year Period				
							2021	2022	2023	2024	2025+
Summary for Alternative Scenario 1 (50% MST Scenario)											
Source Categories with RTR data	74	4,068	1,345	33.1%	\$8,456,272	(\$46,242,063)	\$2,114,068	(\$9,446,448)	(\$21,006,963)	(\$32,567,479)	(\$46,242,063)
All Other Source Categories (22 extrapolated categories plus oil and gas production, natural gas transmission and storage)	24	1,294	219	16.9%	\$1,377,642	(\$7,464,412)	\$344,410	(\$1,521,693)	(\$3,387,796)	(\$5,253,898)	(\$7,464,412)
ICI Boilers and Process Heaters (3 categories)	3	1,821	545	29.9%	\$3,426,519	(\$20,101,369)	\$856,630	(\$4,168,712)	(\$9,194,055)	(\$14,219,397)	(\$20,101,369)
All Source Categories	101	7,183	2,109	29.4%	\$13,260,432	(\$73,807,843)	\$3,315,108	(\$15,136,853)	(\$33,588,813)	(\$52,040,774)	(\$73,807,843)
Summary for Primary Scenario (75% MST Scenario)											
Source Categories with RTR data	74	4,068	1,614	39.7%	\$10,147,526	(\$56,137,515)	\$2,536,882	(\$11,497,497)	(\$25,531,876)	(\$39,566,255)	(\$56,137,515)
All Other Source Categories (22 extrapolated categories plus oil and gas production, natural gas transmission and storage)	24	1,294	266	20.6%	\$1,680,049	(\$9,030,684)	\$420,012	(\$1,837,659)	(\$4,095,330)	(\$6,353,001)	(\$9,030,684)
ICI Boilers and Process Heaters (3 categories)	3	1,821	687	37.7%	\$4,319,300	(\$25,456,533)	\$1,079,825	(\$5,284,308)	(\$11,648,442)	(\$18,012,575)	(\$25,456,533)
All Source Categories	101	7,183	2,567	35.7%	\$16,146,875	(\$90,624,732)	\$4,036,719	(\$18,619,464)	(\$41,275,647)	(\$63,931,830)	(\$90,624,732)

Summary for Alternative Scenario 2 (125% MST Scenario)											
Source Categories with RTR data	74	4,068	1,965	48.3%	\$12,354,330	(\$68,736,482)	\$3,088,583	(\$14,095,538)	(\$31,279,659)	(\$48,463,779)	(\$68,736,482)
All Other Source Categories (22 extrapolated categories plus oil and gas production, natural gas transmission and storage)	24	1,294	330	25.5%	\$2,068,885	(\$11,528,843)	\$517,221	(\$2,364,990)	(\$5,247,200)	(\$8,129,411)	(\$11,528,843)
ICI Boilers and Process Heaters (3 categories)	3	1,821	814	44.7%	\$5,117,773	(\$30,740,964)	\$1,279,443	(\$6,405,798)	(\$14,091,039)	(\$21,776,280)	(\$30,740,964)
All Source Categories	101	7,183	3,109	43.3%	\$19,540,989	(\$111,006,290)	\$4,885,247	(\$22,866,325)	(\$50,617,898)	(\$78,369,470)	(\$111,006,290)

6. Uncertainties

Predicting facility behavior: A major assumption in estimating potential cost savings is that all major sources in each source category that can reclassify to an area source will do so subject to limits on HAP potential to emit (PTE). It is possible that major sources may choose not to reclassify because the cost savings may not be a sufficient incentive to do so, or for other reasons. For example, facilities that have already made substantial investments in controls or process changes needed to comply may choose to retain major source status to maintain flexibility to allow for future increases in production. This uncertainty affects the number of facilities that would be eligible to obtain area source status.

Compliance cost estimates for major and area sources: The current and future compliance costs are based on compliance costs estimated to fulfill Paperwork Reduction Act requirements (44 U.S.C. § 3501 et seq.). Those costs are estimated for each major source subpart for a typical facility using the estimate of hours needed to complete monitoring, recordkeeping, and reporting activities, and other capital and operation and maintenance costs. These estimates are subject to public review and comment, but they are not the actual costs for each facility. The estimated compliance costs after facilities obtain area source status were based on the average estimated compliance costs for a relatively small number of area source rules. Each major source rule does not have a corresponding area source rule, so the average area source rule cost may not be representative of the actual compliance cost for all source categories.

Appendix 1. List of Information Collection Requests (ICRs) Used for Estimating Projected Compliance Costs (Savings) Per Source Category

Major Source NESHAP
Supporting Statement, NESHAP for Source Categories: Generic Maximum Achievable Control Technology Standards for Acetal Resin; Acrylic and Modacrylic Fiber; Hydrogen Fluoride and Polycarbonate Production (40 CFR Part 63, Subpart YY) (Renewal) U.S. EPA, July 27, 2015
Supporting Statement, NESHAP for Aerospace Manufacturing and Rework Facilities (40 CFR Part 63, Subpart GG) (Renewal) U.S. EPA, October 28, 2016
Supporting Statement, NESHAP for Asphalt Processing and Asphalt Roofing Manufacturing (40 CFR Part 63, Subpart LLLLL) (Renewal) U.S. EPA, September 11, 2015
Supporting Statement, NESHAP for Automobile and Light-duty Truck Surface Coating (40 CFR Part 63, Subpart IIII) (Renewal) U.S. EPA, September 8, 2016
Supporting Statement, NESHAP for Boat Manufacturing (40 CFR Part 63, subpart VVVV) (Renewal) U.S. EPA, January 31, 2017
Supporting Statement, NESHAP for Brick and Structural Clay Products Manufacturing (40 CFR Part 63, Subpart JJJJ) U.S. EPA, July 2014
Supporting Statement, NESHAP for Engine Test Cells/Stands (40 CFR part 63, subpart PTTTT) (Renewal) U.S. EPA, December 14, 2018
Supporting Statement, NESHAP for Printing, Coating and Dyeing of Fabrics and Other Textiles (40 CFR Part 63, Subpart OOOO) (Renewal) U.S. EPA, September 10, 2015
Supporting Statement, NESHAP for Ferroalloys Production: Ferromanganese and Silicomanganese (40 CFR Part 63, Subpart XXX) (Renewal) U.S. EPA, April 17, 2015
Supporting Statement, NESHAP for Flexible Polyurethane Foam Product (40 CFR Part 63, Subpart III) U.S. EPA, August 15, 2014
Supporting Statement, NESHAP for Friction Materials Manufacturing (40 CFR Part 63, Subpart QQQQ) (Renewal) U.S. EPA, October 27, 2014
Supporting Statement, NESHAP for Carbon Black, Ethylene, Cyanide and Spandex (40 CFR Part 63, Subpart YY) (Renewal) U.S. EPA, March 17, 2015
Supporting Statement, NESHAP for Hydrochloric Acid Production (40 CFR Part 63, Subpart NNNN) (Renewal) U.S. EPA, December 23, 2015
Supporting Statement, NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters (40 CFR Part 63, Subpart DDDDD) (Renewal) U.S. EPA, September 17, 2014.
Supporting Statement, NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources (40 CFR Part 63, Subpart JJJJJ) (Renewal) U.S. EPA, August 18, 2014
Supporting Statement, NESHAP for Integrated Iron and Steel Manufacturing Facilities (40 CFR Part 63, Subpart FFFFF) (Renewal) U.S. EPA, October 6, 2015
NESHAP for Iron and Steel Foundries (40 CFR part 63, subpart EEEEE) (Renewal) U.S. EPA, November 16, 2016

Supporting Statement, NESHAP for the Surface Coating of Large Household and Commercial Appliances (40 CFR Part 63, Subpart NNNN) (Renewal) U.S. EPA, September 14, 2015
Supporting Statement, NESHAP for Leather Finishing Operations (40 CFR Part 63, Subpart TTTT) (Renewal) U.S. EPA, December 1, 2015
Supporting Statement, NESHAP for Lime Manufacturing (40 CFR Part 63, Subpart TTTT) (Renewal) U.S. EPA, January 27, 2017
Supporting Statement, NESHAP for Marine Tank Vessel Loading Operations (40 CFR Part 63, Subpart Y) (Renewal) U.S. EPA, July 28, 2014
Supporting Statement, NESHAP for Metal Can Manufacturing Surface Coating (40 CFR Part 63, Subpart KKKK) (Renewal) U.S. EPA, September 20, 2016
Supporting Statement, NESHAP for Metal Coil Surface Coating Plants (40 CFR Part 63, Subpart SSSS) (Renewal) U.S. EPA, March 17, 2015
Supporting Statement, NESHAP for Metal Furniture Surface Coating (40 CFR Part 63, Subpart RRRR) (Renewal) U.S. EPA, December 8, 2015
Supporting Statement, NESHAP for Mineral Wool Production (40 CFR Part 63, Subpart DDD) (Renewal) U.S. EPA, June 16, 2015
Supporting Statement, NESHAP for Miscellaneous Metal Parts and Products (40 CFR Part 63, Subpart MMMM) (Renewal) U.S. EPA, July 22, 2015
Supporting Statement, NESHAP for Miscellaneous Coating Manufacturing (40 CFR Part 63, Subpart HHHHH) (Renewal) U.S. EPA, August 30, 2019
Supporting Statement, NESHAP for Miscellaneous Organic Chemical Manufacturing (40 CFR Part 63, Subpart FFFF) (Renewal) U.S. EPA, May 20, 2019
Supporting Statement, NESHAP for Natural Gas Transmission and Storage (40 CFR Part 63, Subpart HHH) (Renewal) U.S. EPA, April 17, 2015
Supporting Statement, NESHAP for Nutritional Yeast Manufacturing Residual Risk and Technology Review (40 CFR part 63, subpart CCCC), November 8, 2017
Supporting Statement, NESHAP for Oil and Natural Gas Production (40 CFR Part 63, Subpart HH) (Renewal) U.S. EPA, June 13, 2016
Supporting Statement, NESHAP for Organic Liquid Distribution (non-Gasoline) (40 CFR Part 63, Subpart EEEE) (Renewal) U.S. EPA, August 16, 2016
Supporting Statement, NESHAP for Off-Site Waste and Recovery Operations (40 CFR Part 63, Subpart DD) (Renewal) U.S. EPA, September 2, 2016
Supporting Statement, NESHAP for Group I Polymers and Resins (40 CFR Part 63, Subpart U) (Renewal) U.S. EPA, June 12, 2014
Supporting Statement, NESHAP for Epoxy Resin and Non-Nylon Polyamide Production (40 CFR Part 63, Subpart W) (Renewal) U.S. EPA, June 6, 2014
Supporting Statement, NESHAP for the Manufacture of Amino/Phenolic Resins (40 CFR Part 63, Subpart OOO) (Renewal) U.S. EPA, September 19, 2016
Supporting Statement, NESHAP for Group IV Polymers and Resins (40 CFR Part 63, Subpart JJJ) (Renewal) U.S. EPA, March 9, 2017

Supporting Statement, NESHAP for Paper and Other Web Coating (40 CFR Part 63, Subpart JJJJ) (Renewal) U.S. EPA, March 23, 2019
Supporting Statement, NESHAP for Pesticide Active Ingredient Production (40 CFR Part 63, Subpart MMM) (Renewal) U.S. EPA, June 24, 2015
Supporting Statement, NESHAP for Plywood and Composite Products (40 CFR Part 63, Subpart DDDD) (Renewal) U.S. EPA, October 27, 2016
Supporting Statement, NESHAP for Polyether Polyols Production (40 CFR Part 63, Subpart PPP) (Renewal) U.S. EPA, March 29, 2017
Supporting Statement, NESHAP for Pharmaceuticals Production (40 CFR Part 63, Subpart GGG) (Renewal) U.S. EPA, May 9, 2014
Supporting Statement, NESHAP for Phosphoric Acid Manufacturing and Phosphate Fertilizers Production (40 CFR Part 63, Subparts AA and BB) (Renewal) U.S. EPA, June 15, 2016
Supporting Statement, NESHAP for Plastic Parts and Products Surface Coating (40 CFR Part 63, Subpart PPPP) (Renewal) U.S. EPA, May 3, 2016
Supporting Statement, Publicly Owned Treatment Works (40 CFR Part 63, Subpart VVV) U.S. EPA, October 11, 2017
Supporting Statement, NESHAP for Primary Aluminum Reduction Plants (40 CFR Part 63, Subpart LL) (Renewal) U.S. EPA, May 21, 2015
Supporting Statement, NESHAP for Primary Lead Smelters (40 CFR Part 63, Subpart TTT) (Renewal) U.S. EPA, February 20, 2015
Supporting Statement, NESHAP for Printing and Publishing Industry (40 CFR Part 63, Subpart KK) (Renewal) U.S. EPA, April 5, 2016
Supporting Statement, NESHAP for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfit, and Stand-Alone Semichemical Pulp Mills (40 CFR Part 63, Subpart MM) (Renewal) U.S. EPA, January 22, 2015
Supporting Statement, NESHAP for Petroleum Refineries (40 CFR Part 63, Subpart CC) (Renewal) U.S. EPA, March 11, 2016
Supporting Statement, NESHAP for Reinforced Plastic Composites Production (40 CFR Part 63, Subpart WWWW) (Renewal) U.S. EPA, March 18, 2019
Supporting Statement, NESHAP for Secondary Aluminum Production (40 CFR Part 63, Subpart RRR) (Renewal) U.S. EPA, December 23, 2015
Supporting Statement, NESHAP for Shipbuilding and Ship Repair Facilities - Surface Coating (40 CFR Part 63, Subpart II) (Renewal) U.S. EPA, February 18, 2015
Supporting Statement, NESHAP for Site Remediation (40 CFR Part 63, Subpart GGGGG) (Renewal) U.S. EPA, September 8, 2016
Supporting Statement, NESHAP for Steel Pickling, HCl Process Facilities and Hydrochloric Acid Regeneration Plants (40 CFR Part 63, Subpart CCC) (Renewal) U.S. EPA, June 23, 2015
Supporting Statement, NESHAP for Stationary Combustion Turbines (40 CFR Part 63, Subpart YYYY) (Renewal) U.S. EPA, August 26, 2016
Supporting Statement, NESHAP for Taconite Iron Ore Processing (40 CFR Part 63, Subpart RRRRR) (Renewal) U.S. EPA, April 30, 2019

Supporting Statement, NESHAP for Solvent Extraction for Vegetable Oil Production (40 CFR Part 63, Subpart GGGG) (Renewal) U.S. EPA, December 15, 2017
Supporting Statement, NESHAP for Wet-Formed Fiberglass Mat Production (40 CFR Part 63, Subpart HHHH) (Renewal) U.S. EPA, December 1, 2015
Supporting Statement, NESHAP for the Wood Building Products Surface Coating Industry (40 CFR Part 63, Subpart QQQQ) (Renewal) U.S. EPA, December 23, 2015
Supporting Statement, NESHAP for Wood Furniture Manufacturing Operations (40 CFR Part 63, Subpart JJ) (Renewal) U.S. EPA, December 16, 2014
Supporting Statement, NSPS/NESHAP for Wool Fiberglass Insulation Manufacturing Plants (40 CFR Part 60, Subpart PPP and 40 CFR Part 63, Subpart NNN) (Renewal) U.S. EPA, May 16, 2016
Area Source NESHAP
Supporting Statement, NESHAP for Chemical Manufacturing Area Sources (40 CFR Part 63, Subpart VVVVVV) (Renewal) U.S. EPA, May 22, 2019
Supporting Statement, NESHAP for Nine Metal Fabrication and Finishing Area Source Categories (40 CFR Part 63, Subpart XXXXXX) (Renewal) U.S. EPA, April 17, 2019
Supporting Statement, NESHAP for Area Sources: Acrylic and Modacrylic Fibers (40 CFR Part 63, Subpart LLLLLL) (Renewal) U.S. EPA, December 19, 2017
Supporting Statement, NESHAP for Area Sources: Flexible Polyurethane Foam Production and Fabrication (40 CFR Part 63, Subpart OOOOOO) (Renewal) U.S. EPA, December 19, 2017
Supporting Statement, NESHAP for Source Categories: Gasoline Distribution Bulk Terminals, Bulk Plants, Pipeline Facilities, and Gasoline Dispensing Facilities (40 CFR Part 63, Subpart BBBB and CCCCC) (Renewal) U.S. EPA, March 8, 2019
Supporting Statement, NESHAP for Publicly Owned Treatment Works (40 CFR Part 63, Subpart VVV) (Renewal) U.S. EPA, January 29, 2020
Supporting Statement, NESHAP for Secondary Aluminum Production (40 CFR Part 63, Subpart RRR) (Renewal) U.S. EPA, November 12, 2019
Supporting Statement, NESHAP for Wood Furniture Manufacturing Operations (40 CFR Part 63, Subpart JJ) (Renewal) U.S. EPA, December 13, 2018

Appendix 2: Permitting Costs and Compliance Costs and Savings Estimates for Alternative Scenario 1 (50 Percent of the MST).

Category	Facilities in Category Subject to MACT	Number of Facilities with Emissions Below 50% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025+
Source categories for which the EPA had RTR modeling files to estimate the number of facilities with emissions below the 50% of the MST.									
Acetal Resins	3	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Aerospace - federal government owned	36	23	\$144,605	\$(1,199,486)	\$36,151	\$(263,720)	\$(563,592)	\$(863,464)	\$(1,199,486)
Aerospace - Privately Owned	108	83	\$521,837	\$(9,431,181)	\$130,459	\$(2,227,336)	\$(4,585,131)	\$(6,942,926)	\$(9,431,181)
AMF (Acrylic/Modacrylic Fibers)	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Asphalt	8	2	\$12,574	\$(106,738)	\$3,144	\$(23,541)	\$(50,225)	\$(76,910)	\$(106,738)
Auto and Light Duty Truck	43	2	\$12,574	\$(85,607)	\$3,144	\$(18,258)	\$(39,660)	\$(61,062)	\$(85,607)
Boat Manufacturing	93	15	\$94,308	\$(220,294)	\$23,577	\$(31,496)	\$(86,570)	\$(141,643)	\$(220,294)
Brick	74	41	\$257,775	\$(614,649)	\$64,444	\$(89,219)	\$(242,881)	\$(396,543)	\$(614,649)
Engine Test Cells/Stands	59	25	\$157,180	\$(290,889)	\$39,295	\$(33,427)	\$(106,150)	\$(178,872)	\$(290,889)
Ethylene Production	32	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Fabric	43	22	\$138,318	\$(283,646)	\$34,580	\$(36,332)	\$(107,243)	\$(178,155)	\$(283,646)
Ferroalloys	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Flexible Foam Production	12	11	\$69,159	\$(78,747)	\$17,290	\$(2,397)	\$(22,084)	\$(41,770)	\$(78,747)
Friction	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Hydrogen Fluoride-HF	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
HCl Production	19	4	\$25,149	\$(521,496)	\$6,287	\$(124,087)	\$(254,461)	\$(384,835)	\$(521,496)
Integrated Iron and Steel	12	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Iron and Steel Foundries (Major Sources)	45	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Large Appliances	10	6	\$37,723	\$(243,866)	\$9,431	\$(51,536)	\$(112,502)	\$(173,469)	\$(243,866)
Leather	4	2	\$12,574	\$(4,880)	\$3,144	\$1,924	\$703	\$(517)	\$(4,880)
Lime Manufacturing	35	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Marine Vessel Loading	152	85	\$534,411	\$32,466	\$133,603	\$141,719	\$149,836	\$157,952	\$32,466
Metal Can	5	2	\$12,574	\$(80,856)	\$3,144	\$(17,070)	\$(37,284)	\$(57,498)	\$(80,856)
Metal Coil	48	31	\$194,903	\$(1,113,500)	\$48,726	\$(229,649)	\$(508,024)	\$(786,399)	\$(1,113,500)
Metal Furniture	16	9	\$56,585	\$(241,934)	\$14,146	\$(46,337)	\$(106,821)	\$(167,304)	\$(241,934)
Mineral Wool	7	1	\$6,287	\$(35,065)	\$1,572	\$(7,194)	\$(15,961)	\$(24,727)	\$(35,065)
Misc. Metal Parts	368	200	\$1,257,438	\$(10,063,281)	\$314,360	\$(2,201,461)	\$(4,717,281)	\$(7,233,101)	\$(10,063,281)

Category	Facilities in Category Subject to MACT	Number of Facilities with Emissions Below 50% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025+
Miscellaneous Coating Manufacturing	43	16	\$100,595	\$(2,264,356)	\$25,149	\$(540,940)	\$(1,107,029)	\$(1,673,118)	\$(2,264,356)
Miscellaneous Organic Chemical Manufacturing	197	22	\$138,318	\$(3,937,401)	\$34,580	\$(949,771)	\$(1,934,121)	\$(2,918,471)	\$(3,937,401)
Nutritional Yeast	4	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Organic Liquids Distribution (Non-Gasoline)	178	53	\$333,221	\$(1,314,861)	\$83,305	\$(245,410)	\$(574,125)	\$(902,840)	\$(1,314,861)
OSWRO	38	17	\$106,882	\$(1,599,014)	\$26,721	\$(373,033)	\$(772,787)	\$(1,172,540)	\$(1,599,014)
P&R I (7 Source Categories)	18	1	\$6,287	\$1,286	\$1,572	\$1,893	\$2,215	\$2,536	\$1,286
P&R II (2 Source Categories)	7	2	\$12,574	\$(116,433)	\$3,144	\$(25,965)	\$(55,073)	\$(84,181)	\$(116,433)
P&R III	19	5	\$31,436	\$(639,207)	\$7,859	\$(151,943)	\$(311,744)	\$(471,546)	\$(639,207)
P&R IV (5 Source Categories)	31	1	\$6,287	\$(141,470)	\$1,572	\$(33,796)	\$(69,163)	\$(104,531)	\$(141,470)
PAI (Pesticide Active Ingredient Production)	18	2	\$12,574	\$(142,294)	\$3,144	\$(32,430)	\$(68,004)	\$(103,577)	\$(142,294)
Paper and Other Web Coatings: Surface Coating	171	46	\$289,211	\$(44,077)	\$72,303	\$61,283	\$50,264	\$39,245	\$(44,077)
PEPO (Polyether Polyols Production)	23	6	\$37,723	\$(88,678)	\$9,431	\$(12,739)	\$(34,908)	\$(57,078)	\$(88,678)
Pharmaceuticals	26	2	\$12,574	\$(1,139)	\$3,144	\$2,859	\$2,574	\$2,289	\$(1,139)
Phosphate Fertilizer	11	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Phosphoric Acid	12	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Plastic Parts	125	38	\$238,913	\$(1,608,497)	\$59,728	\$(342,396)	\$(744,520)	\$(1,146,644)	\$(1,608,497)
Plywood and Composite Wood Products	233	13	\$81,733	\$(213,936)	\$20,433	\$(33,051)	\$(86,535)	\$(140,019)	\$(213,936)
Polycarbonates	4	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
POTW	10	6	\$37,723	\$4	\$9,431	\$9,432	\$9,433	\$9,434	\$4
Primary Aluminum	13	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Primary Lead	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Printing and Publishing	172	91	\$572,134	\$(1,650,665)	\$143,034	\$(269,633)	\$(682,299)	\$(1,094,965)	\$(1,650,665)
Pulp and Paper Combustion Sources	109	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Refineries (2 Source Categories)	142	20	\$125,744	\$(2,423,649)	\$31,436	\$(574,476)	\$(1,180,388)	\$(1,786,301)	\$(2,423,649)
Reinforced Plastic Composites	449	134	\$842,484	\$(230,875)	\$210,621	\$152,902	\$95,183	\$37,465	\$(230,875)
Secondary Aluminum	52	5	\$31,436	\$(14,934)	\$7,859	\$4,125	\$392	\$(3,342)	\$(14,934)
Shipbuilding	84	16	\$100,595	\$(848,043)	\$25,149	\$(186,862)	\$(398,873)	\$(610,883)	\$(848,043)
Site Remediation	102	20	\$125,744	\$(921,651)	\$31,436	\$(198,977)	\$(429,389)	\$(659,802)	\$(921,651)
Steel Pickling	51	35	\$220,052	\$(1,246,060)	\$55,013	\$(256,502)	\$(568,017)	\$(879,532)	\$(1,246,060)

Category	Facilities in Category Subject to MACT	Number of Facilities with Emissions Below 50% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025+
Taconite Iron Ore Processing	8	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Vegetable Oil	88	1	\$6,287	\$(35,287)	\$1,572	\$(7,250)	\$(16,072)	\$(24,893)	\$(35,287)
Wet Formed Fiberglass Mat	7	2	\$12,574	\$(23,711)	\$3,144	\$(2,784)	\$(8,712)	\$(14,640)	\$(23,711)
Wood Building Products	50	26	\$163,467	\$(635,056)	\$40,867	\$(117,897)	\$(276,661)	\$(435,425)	\$(635,056)
Wood Furniture	333	201	\$1,263,725	\$(1,518,410)	\$315,931	\$(63,671)	\$(443,274)	\$(822,876)	\$(1,518,410)
TOTALS for categories assessed by RTR	4,068	1,345	\$8,456,272	\$(46,242,063)	\$2,114,068	\$(9,446,448)	\$(21,006,963)	\$(32,567,479)	\$(46,242,063)
Source categories for which the EPA extrapolated the number of facilities with emissions below the 50% of the MST									
Carbon Black (GMACT II)	16	4	\$25,816	\$(122,789)	\$6,454	\$(24,243)	\$(54,940)	\$(85,638)	\$(122,789)
Cellulose Products Manufacturing	11	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Clay Ceramics Manufacturing	3	1	\$6,747	\$(16,425)	\$1,687	\$(2,419)	\$(6,526)	\$(10,632)	\$(16,425)
Coke Ovens: Charging, Top Side, and Door	22	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Coke Ovens: Pushing, Quenching, & Battery	17	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Cyanide Chemicals (GMACT II)	80	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Flexible Foam Fabrication	5	2	\$11,082	\$(60,692)	\$2,770	\$(12,403)	\$(27,576)	\$(42,749)	\$(60,692)
Gasoline Distribution (Stage 1)	187	27	\$172,437	\$(3,154,549)	\$43,109	\$(745,528)	\$(1,534,165)	\$(2,322,802)	\$(3,154,549)
Hazardous Organic NESHAP	365	94	\$588,920	\$(2,801,117)	\$147,230	\$(553,049)	\$(1,253,328)	\$(1,953,607)	\$(2,801,117)
Industrial Cooling Towers	33	7	\$44,010	\$(281,303)	\$11,003	\$(59,323)	\$(129,649)	\$(199,974)	\$(281,303)
Magnetic Tape	0	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Mercury Cell Chlor-Alkali Plants	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Natural Gas Transmission	83	27	\$169,754	\$(101,958)	\$42,439	\$16,949	\$(8,540)	\$(34,030)	\$(101,958)
Oil and Gas	106	35	\$220,052	\$(161,199)	\$55,013	\$14,713	\$(25,587)	\$(65,887)	\$(161,199)
Primary Copper	0	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Primary Magnesium Refining	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Pulp & Paper (non-combust) MACT	114	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
PVC	4	1	\$6,454	\$(30,697)	\$1,613	\$(6,061)	\$(13,735)	\$(21,409)	\$(30,697)
Refractory Products Manufacturing	8	3	\$17,993	\$(43,800)	\$4,498	\$(6,452)	\$(17,402)	\$(28,352)	\$(43,800)
Rubber Tire Manufacturing	21	7	\$46,543	\$(254,907)	\$11,636	\$(52,091)	\$(115,818)	\$(179,545)	\$(254,907)
Semiconductor Manufacturing	23	11	\$67,834	\$(434,977)	\$16,959	\$(91,786)	\$(200,530)	\$(309,274)	\$(434,977)
Spandex (GMACT II)	5	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-

Category	Facilities in Category Subject to MACT	Number of Facilities with Emissions Below 50% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025+
Utility Boilers	193	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
TOTALS for extrapolated source categories	1294	219	\$1,377,642	\$(7,464,412)	\$344,410	\$(1,521,693)	\$(3,387,796)	\$(5,253,898)	\$(7,464,412)
Industrial, Commercial, Institutional Boilers and Process Heaters (3 source categories)									
ICI Boilers and Process Heaters	1,821	545	\$3,426,519	\$(20,101,369)	\$856,630	\$(4,168,712)	\$(9,194,055)	\$(14,219,397)	\$(20,101,369)
Reciprocating Internal Combustion Engines (RICE) includes area sources									
Reciprocating Internal Combustion Engines (RICE) includes area sources*	4,205	0	\$3,187,606	\$-	\$796,901	\$796,901	\$796,901	\$796,901	\$-

*As explained in section 4.B.iv of this memo, permitting costs are estimated for RICE, but no cost savings are estimated. However, the permitting costs were not included in the total costs for all source categories.

\$13,260,432	\$(73,807,843)	Totals without the RICE
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Appendix 3: Permitting Costs and Compliance Costs and Savings Estimates for the Primary Scenario (75 Percent of the MST).

Category	Facilities in Category Subject to MACT	Number of Facilities with Emissions Below 75% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025
Source categories for which the EPA had RTR modeling files to estimate the number of facilities with emissions below the 75% of the MST.									
Acetal Resins	3	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Aerospace - federal government owned	36	26	\$163,467	\$(1,355,941)	\$40,867	\$(298,119)	\$(637,104)	\$(976,089)	\$(1,355,941)
Aerospace - Privately Owned	108	92	\$578,422	\$(10,453,839)	\$144,605	\$(2,468,854)	\$(5,082,314)	\$(7,695,774)	\$(10,453,839)
AMF (Acrylic/Modacrylic Fibers)	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Asphalt	8	2	\$12,574	\$(106,738)	\$3,144	\$(23,541)	\$(50,225)	\$(76,910)	\$(106,738)
Auto and Light Duty Truck	43	5	\$31,436	\$(214,018)	\$7,859	\$(45,645)	\$(99,150)	\$(152,654)	\$(214,018)
Boat Manufacturing	93	24	\$150,893	\$(352,470)	\$37,723	\$(50,394)	\$(138,512)	\$(226,629)	\$(352,470)
Brick	74	47	\$295,498	\$(704,598)	\$73,874	\$(102,275)	\$(278,424)	\$(454,574)	\$(704,598)
Engine Test Cells/Stands	59	26	\$163,467	\$(302,525)	\$40,867	\$(34,764)	\$(110,396)	\$(186,027)	\$(302,525)
Ethylene Production	32	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Fabric	43	24	\$150,893	\$(309,432)	\$37,723	\$(39,635)	\$(116,993)	\$(194,351)	\$(309,432)
Ferroalloys	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Flexible Foam Production	12	11	\$69,159	\$(78,747)	\$17,290	\$(2,397)	\$(22,084)	\$(41,770)	\$(78,747)
Friction	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Hydrogen Fluoride	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
HCl Production	19	4	\$25,149	\$(521,496)	\$6,287	\$(124,087)	\$(254,461)	\$(384,835)	\$(521,496)
Integrated Iron and Steel	12	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Iron and Steel Foundries (Major Sources)	45	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Large Appliances	10	7	\$44,010	\$(284,510)	\$11,003	\$(60,125)	\$(131,253)	\$(202,380)	\$(284,510)
Leather	4	2	\$12,574	\$(4,880)	\$3,144	\$1,924	\$703	\$(517)	\$(4,880)
Lime Manufacturing	35	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Marine Vessel Loading	152	90	\$565,847	\$34,376	\$141,462	\$150,056	\$158,650	\$167,244	\$34,376
Metal Can	5	3	\$18,862	\$(121,284)	\$4,715	\$(25,606)	\$(55,927)	\$(86,248)	\$(121,284)
Metal Coil	48	35	\$220,052	\$(1,257,177)	\$55,013	\$(259,281)	\$(573,576)	\$(887,870)	\$(1,257,177)
Metal Furniture	16	10	\$62,872	\$(268,815)	\$15,718	\$(51,486)	\$(118,690)	\$(185,893)	\$(268,815)
Mineral Wool	7	2	\$12,574	\$(70,130)	\$3,144	\$(14,389)	\$(31,921)	\$(49,454)	\$(70,130)
Misc. Metal Parts	368	233	\$1,464,915	\$(11,723,722)	\$366,229	\$(2,564,702)	\$(5,495,632)	\$(8,426,563)	\$(11,723,722)

Category	Facilities in Category Subject to MACT	Number of Facilities with Emissions Below 75% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025
Miscellaneous Coating Manufacturing	43	17	\$106,882	\$(2,405,878)	\$26,721	\$(574,749)	\$(1,176,219)	\$(1,777,688)	\$(2,405,878)
Miscellaneous Organic Chemical Manufacturing	197	28	\$176,041	\$(5,011,237)	\$44,010	\$(1,208,799)	\$(2,461,608)	\$(3,714,417)	\$(5,011,237)
Nutritional Yeast	4	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Organic Liquids Distribution (Non-Gasoline)	178	57	\$358,370	\$(1,414,096)	\$89,592	\$(263,931)	\$(617,455)	\$(970,979)	\$(1,414,096)
OSWRO	38	21	\$132,031	\$(1,975,253)	\$33,008	\$(460,805)	\$(954,619)	\$(1,448,432)	\$(1,975,253)
P&R I (7 Source Categories)	18	1	\$6,287	\$1,286	\$1,572	\$1,893	\$2,215	\$2,536	\$1,286
P&R II (2 Source Categories)	7	2	\$12,574	\$(116,433)	\$3,144	\$(25,965)	\$(55,073)	\$(84,181)	\$(116,433)
P&R III	19	5	\$31,436	\$(639,207)	\$7,859	\$(151,943)	\$(311,744)	\$(471,546)	\$(639,207)
P&R IV (5 Source Categories)	31	2	\$12,574	\$(282,940)	\$3,144	\$(67,591)	\$(138,326)	\$(209,061)	\$(282,940)
PAI (Pesticide Active Ingredient Production)	18	4	\$25,149	\$(284,589)	\$6,287	\$(64,860)	\$(136,007)	\$(207,154)	\$(284,589)
Paper and Other Web Coatings: Surface Coating	171	55	\$345,795	\$(52,701)	\$86,449	\$73,274	\$60,098	\$46,923	\$(52,701)
PEPO (Polyether Polyols Production)	23	7	\$44,010	\$(103,458)	\$11,003	\$(14,862)	\$(40,726)	\$(66,591)	\$(103,458)
Pharmaceuticals	26	6	\$37,723	\$(3,417)	\$9,431	\$8,577	\$7,722	\$6,868	\$(3,417)
Phosphate Fertilizer	11	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Phosphoric Acid	12	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Plastic Parts	125	53	\$333,221	\$(2,243,429)	\$83,305	\$(477,552)	\$(1,038,409)	\$(1,599,267)	\$(2,243,429)
Plywood and Composite Wood Products	233	25	\$157,180	\$(411,416)	\$39,295	\$(63,559)	\$(166,413)	\$(269,267)	\$(411,416)
Polycarbonates	4	1	\$6,287	\$(45,064)	\$1,572	\$(9,694)	\$(20,960)	\$(32,226)	\$(45,064)
POTW	10	7	\$44,010	\$4	\$11,003	\$11,004	\$11,005	\$11,006	\$4
Primary Aluminum	13	1	\$6,287	\$(507,212)	\$1,572	\$(125,231)	\$(252,034)	\$(378,837)	\$(507,212)
Primary Lead	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Printing and Publishing	172	101	\$635,006	\$(1,832,057)	\$158,752	\$(299,263)	\$(757,277)	\$(1,215,291)	\$(1,832,057)
Pulp and Paper Combustion Sources	109	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Refineries (2 Source Categories)	142	24	\$150,893	\$(2,908,379)	\$37,723	\$(689,371)	\$(1,416,466)	\$(2,143,561)	\$(2,908,379)
Reinforced Plastic Composites	449	180	\$1,131,694	\$(310,131)	\$282,924	\$205,391	\$127,858	\$50,326	\$(310,131)
Secondary Aluminum	52	6	\$37,723	\$(17,921)	\$9,431	\$4,951	\$470	\$(4,010)	\$(17,921)
Shipbuilding	84	50	\$314,360	\$(2,650,134)	\$78,590	\$(583,944)	\$(1,246,477)	\$(1,909,011)	\$(2,650,134)
Site Remediation	102	21	\$132,031	\$(967,733)	\$33,008	\$(208,926)	\$(450,859)	\$(692,792)	\$(967,733)
Steel Pickling	51	37	\$232,626	\$(1,317,264)	\$58,157	\$(271,159)	\$(600,475)	\$(929,791)	\$(1,317,264)

Category	Facilities in Category Subject to MACT	Number of Facilities with Emissions Below 75% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025
Taconite Iron Ore Processing	8	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Vegetable Oil	88	2	\$12,574	\$(70,574)	\$3,144	\$(14,500)	\$(32,143)	\$(49,787)	\$(70,574)
Wet Formed Fiberglass Mat	7	4	\$25,149	\$(47,422)	\$6,287	\$(5,568)	\$(17,424)	\$(29,279)	\$(47,422)
Wood Building Products	50	30	\$188,616	\$(732,757)	\$47,154	\$(136,035)	\$(319,224)	\$(502,413)	\$(732,757)
Wood Furniture	333	224	\$1,408,331	\$(1,692,158)	\$352,083	\$(70,957)	\$(493,997)	\$(917,036)	\$(1,692,158)
TOTALS for categories assessed by RTR	4,068	1,614	\$10,147,526	\$(56,137,515)	\$2,536,882	\$(11,497,497)	\$(25,531,876)	\$(39,566,255)	\$(56,137,515)
Source categories for which the EPA extrapolated the number of facilities with emissions below 75% of the MST.									
Carbon Black (GMACT II)	16	5	\$31,667	\$(145,847)	\$7,917	\$(28,545)	\$(65,007)	\$(101,468)	\$(145,847)
Cellulose Products Manufacturing	11	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Clay Ceramics Manufacturing	3	1	\$8,127	\$(20,052)	\$2,032	\$(2,981)	\$(7,994)	\$(13,007)	\$(20,052)
Coke Ovens: Charging, Top Side, and Door	22	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Coke Ovens: Pushing, Quenching, & Battery	17	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Cyanide Chemicals (GMACT II)	80	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Flexible Foam Fabrication	5	2	\$14,474	\$(83,532)	\$3,619	\$(17,264)	\$(38,147)	\$(59,030)	\$(83,532)
Gasoline Distribution (Stage 1)	187	32	\$203,789	\$(3,758,845)	\$50,947	\$(888,764)	\$(1,828,475)	\$(2,768,187)	\$(3,758,845)
Hazardous Organic NESHP	365	115	\$722,408	\$(3,327,127)	\$180,602	\$(651,180)	\$(1,482,961)	\$(2,314,743)	\$(3,327,127)
Industrial Cooling Towers	33	9	\$56,585	\$(402,767)	\$14,146	\$(86,546)	\$(187,238)	\$(287,929)	\$(402,767)
Magnetic Tape	0	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Mercury Cell Chlor-Alkali Plants	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Natural Gas Transmission	83	33	\$207,477	\$(124,615)	\$51,869	\$20,716	\$(10,438)	\$(41,592)	\$(124,615)
Oil and Gas	106	42	\$264,062	\$(193,439)	\$66,016	\$17,656	\$(30,704)	\$(79,064)	\$(193,439)
Primary Copper	0	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Primary Magnesium Refining	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Pulp & Paper (non-combust) MACT	114	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
PVC	4	1	\$7,917	\$(36,462)	\$1,979	\$(7,136)	\$(16,252)	\$(25,367)	\$(36,462)
Refractory Products Manufacturing	8	3	\$21,673	\$(53,473)	\$5,418	\$(7,950)	\$(21,318)	\$(34,687)	\$(53,473)
Rubber Tire Manufacturing	21	10	\$60,791	\$(350,832)	\$15,198	\$(72,510)	\$(160,218)	\$(247,926)	\$(350,832)
Semiconductor Manufacturing	23	13	\$81,078	\$(533,693)	\$20,270	\$(113,154)	\$(246,577)	\$(380,000)	\$(533,693)
Spandex (GMACT II)	5	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-

Category	Facilities in Category Subject to MACT	Number of Facilities with Emissions Below 75% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025
Utility Boilers	193	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
TOTALS for extrapolated source categories	1,294	266	\$1,680,049	\$(9,030,684)	\$420,012	\$(1,837,659)	\$(4,095,330)	\$(6,353,001)	\$(9,030,684)
Industrial, Commercial, Institutional Boilers and Process Heaters (3 source categories)									
ICI Boilers and Process Heaters	1,821	687	\$4,319,300	\$(25,456,533)	\$1,079,825	\$(5,284,308)	\$(11,648,442)	\$(18,012,575)	\$(25,456,533)
Reciprocating Internal Combustion Engines (RICE) includes area sources									
Reciprocating Internal Combustion Engines (RICE) includes area sources*	4,205	0	\$3,841,474	\$-	\$960,368	\$960,368	\$960,368	\$960,368	\$-

*As explained in section 4.B.iv of this memo, permitting costs are estimated for RICE, but no cost savings are estimated. However, the permitting costs were not included in the total costs for all source categories.

\$16,146,875	\$(90,624,732)	Totals without the RICE category
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Appendix 4: Permitting Costs and Compliance Costs and Savings Estimates for Alternative Scenario 2 (125-Percent of the MST).

Category	Facilities in Category Subject to MACT	Facilities With Emissions Below 125% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025+
Source categories for which the EPA had RTR modeling files to estimate the number of facilities with emissions below the 125% threshold.									
Acetal Resins	3	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Aerospace - federal government owned	36	29	\$182,329	\$(1,512,396)	\$45,582	\$(332,517)	\$(710,616)	\$(1,088,715)	\$(1,512,396)
Aerospace - Privately Owned	108	95	\$597,283	\$(10,794,725)	\$149,321	\$(2,549,360)	\$(5,248,042)	\$(7,946,723)	\$(10,794,725)
AMF (Acrylic/Modacrylic Fibers)	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Asphalt	8	2	\$12,574	\$(106,738)	\$3,144	\$(23,541)	\$(50,225)	\$(76,910)	\$(106,738)
Auto and Light Duty Truck	43	13	\$81,733	\$(556,446)	\$20,433	\$(118,678)	\$(257,790)	\$(396,901)	\$(556,446)
Boat Manufacturing	93	33	\$207,477	\$(484,646)	\$51,869	\$(69,292)	\$(190,454)	\$(311,615)	\$(484,646)
Brick	74	55	\$345,795	\$(824,529)	\$86,449	\$(119,683)	\$(325,816)	\$(531,948)	\$(824,529)
Engine Test Cells/Standards	59	28	\$176,041	\$(325,796)	\$44,011	\$(37,439)	\$(118,888)	\$(200,337)	\$(325,796)
Ethylene Production	32	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Fabric	43	27	\$169,754	\$(348,111)	\$42,439	\$(44,589)	\$(131,617)	\$(218,645)	\$(348,111)
Ferroalloys	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Flexible Foam Production	12	11	\$69,159	\$(78,747)	\$17,290	\$(2,397)	\$(22,084)	\$(41,770)	\$(78,747)
Friction	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Hydrogen Fluoride- HF	2	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
HCl Production	19	5	\$31,436	\$(651,870)	\$7,859	\$(155,109)	\$(318,076)	\$(481,044)	\$(651,870)
Integrated Iron and Steel	12	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Iron and Steel Foundries (Major Sources)	45	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Large Appliances	10	7	\$44,010	\$(284,510)	\$11,003	\$(60,125)	\$(131,253)	\$(202,380)	\$(284,510)
Leather	4	3	\$18,862	\$(7,320)	\$4,715	\$2,885	\$1,055	\$(775)	\$(7,320)
Lime Manufacturing	35	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Marine Vessel Loading	152	99	\$622,432	\$37,813	\$155,608	\$165,061	\$174,515	\$183,968	\$37,813
Metal Can	5	4	\$25,149	\$(161,712)	\$6,287	\$(34,141)	\$(74,569)	\$(114,997)	\$(161,712)
Metal Coil	48	36	\$226,339	\$(1,293,097)	\$56,585	\$(266,689)	\$(589,964)	\$(913,238)	\$(1,293,097)
Metal Furniture	16	14	\$88,021	\$(376,341)	\$22,005	\$(72,080)	\$(166,165)	\$(260,251)	\$(376,341)
Mineral Wool	7	2	\$12,574	\$(70,130)	\$3,144	\$(14,389)	\$(31,921)	\$(49,454)	\$(70,130)
Misc. Metal Parts	368	281	\$1,766,701	\$(14,138,909)	\$441,675	\$(3,093,052)	\$(6,627,779)	\$(10,162,507)	\$(14,138,909)
Miscellaneous Coating Manufacturing	43	24	\$150,893	\$(3,396,534)	\$37,723	\$(811,410)	\$(1,660,544)	\$(2,509,677)	\$(3,396,534)

Category	Facilities in Category Subject to MACT	Facilities With Emissions Below 125% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025+
Miscellaneous Organic Chemical	197	45	\$282,924	\$(8,053,774)	\$70,731	\$(1,942,713)	\$(3,956,156)	\$(5,969,599)	\$(8,053,774)
Nutritional Yeast	4	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Organic Liquids Distribution (Non-Gasoline)	178	65	\$408,667	\$(1,612,565)	\$102,167	\$(300,975)	\$(704,116)	\$(1,107,257)	\$(1,612,565)
OSWRO	38	25	\$157,180	\$(2,351,491)	\$39,295	\$(548,578)	\$(1,136,451)	\$(1,724,324)	\$(2,351,491)
P&R I (7 Source Categories)	18	1	\$6,287	\$1,286	\$1,572	\$1,893	\$2,215	\$2,536	\$1,286
P&R II (2 Source Categories)	7	2	\$12,574	\$(116,433)	\$3,144	\$(25,965)	\$(55,073)	\$(84,181)	\$(116,433)
P&R III	19	7	\$44,010	\$(894,889)	\$11,003	\$(212,720)	\$(436,442)	\$(660,164)	\$(894,889)
P&R IV (5 Source Categories)	31	4	\$25,149	\$(565,880)	\$6,287	\$(135,183)	\$(276,653)	\$(418,123)	\$(565,880)
PAI (Pesticide Active Ingredient Production)	18	5	\$31,436	\$(355,736)	\$7,859	\$(81,075)	\$(170,009)	\$(258,943)	\$(355,736)
Paper and Other Web Coatings: Surface	171	68	\$427,529	\$(65,158)	\$106,882	\$90,593	\$74,303	\$58,014	\$(65,158)
PEPO (Polyether Polyols Production)	23	7	\$44,010	\$(103,458)	\$11,003	\$(14,862)	\$(40,726)	\$(66,591)	\$(103,458)
Pharmaceuticals	26	8	\$50,298	\$(4,555)	\$12,574	\$11,436	\$10,297	\$9,158	\$(4,555)
Phosphate Fertilizer	11	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Phosphoric Acid	12	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Plastic Parts	125	67	\$421,242	\$(2,836,033)	\$105,310	\$(603,698)	\$(1,312,706)	\$(2,021,715)	\$(2,836,033)
Plywood and Composite Wood Products	233	82	\$515,550	\$(1,349,445)	\$128,887	\$(208,474)	\$(545,835)	\$(883,197)	\$(1,349,445)
Polycarbonates	4	1	\$6,287	\$(45,064)	\$1,572	\$(9,694)	\$(20,960)	\$(32,226)	\$(45,064)
POTW	10	7	\$44,010	\$4	\$11,003	\$11,004	\$11,005	\$11,006	\$4
Primary Aluminum	13	1	\$6,287	\$(507,212)	\$1,572	\$(125,231)	\$(252,034)	\$(378,837)	\$(507,212)
Primary Lead	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Printing and Publishing	172	112	\$704,165	\$(2,031,588)	\$176,041	\$(331,856)	\$(839,753)	\$(1,347,650)	\$(2,031,588)
Pulp and Paper Combustion Sources	109	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Refineries (2 Source Categories)	142	27	\$169,754	\$(3,271,926)	\$42,439	\$(775,543)	\$(1,593,524)	\$(2,411,506)	\$(3,271,926)
Reinforced Plastic Composites	449	236	\$1,483,777	\$(406,616)	\$370,944	\$269,290	\$167,636	\$65,983	\$(406,616)
Secondary Aluminum	52	7	\$44,010	\$(20,908)	\$11,003	\$5,776	\$549	\$(4,678)	\$(20,908)
Shipbuilding	84	62	\$389,806	\$(3,286,167)	\$97,451	\$(724,090)	\$(1,545,632)	\$(2,367,174)	\$(3,286,167)
Site Remediation	102	26	\$163,467	\$(1,198,146)	\$40,867	\$(258,670)	\$(558,206)	\$(857,743)	\$(1,198,146)
Steel Pickling	51	42	\$264,062	\$(1,495,273)	\$66,016	\$(307,803)	\$(681,621)	\$(1,055,439)	\$(1,495,273)
Taconite Iron Ore Processing	8	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Vegetable Oil	88	2	\$12,574	\$(70,574)	\$3,144	\$(14,500)	\$(32,143)	\$(49,787)	\$(70,574)

Category	Facilities in Category Subject to MACT	Facilities With Emissions Below 125% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025+
Wet Formed Fiberglass Mat	7	5	\$31,436	\$(59,277)	\$7,859	\$(6,960)	\$(21,780)	\$(36,599)	\$(59,277)
Wood Building Products	50	31	\$194,903	\$(757,182)	\$48,726	\$(140,570)	\$(329,865)	\$(519,161)	\$(757,182)
Wood Furniture	333	252	\$1,584,372	\$(1,903,678)	\$396,093	\$(79,827)	\$(555,746)	\$(1,031,666)	\$(1,903,678)
TOTALS for categories assessed by RTR	4,068	1,965	\$12,354,330	\$(68,736,482)	\$3,088,583	\$(14,095,538)	\$(31,279,659)	\$(48,463,779)	\$(68,736,482)
Source categories for which the EPA extrapolated the number of facilities with emissions below the 75% threshold.									
Carbon Black (GMACT II)	16	6	\$40,445	\$(215,622)	\$10,111	\$(43,794)	\$(97,700)	\$(151,605)	\$(215,622)
Cellulose Products Manufacturing	11	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Clay Ceramics Manufacturing	3	2	\$9,507	\$(23,267)	\$2,377	\$(3,440)	\$(9,257)	\$(15,073)	\$(23,267)
Coke Ovens: Charging, Top Side, and Door	22	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Coke Ovens: Pushing, Quenching, & Battery	17	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Cyanide Chemicals (GMACT II)	80	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Flexible Foam Fabrication	5	3	\$17,640	\$(104,848)	\$4,410	\$(21,802)	\$(48,014)	\$(74,226)	\$(104,848)
Gasoline Distribution (Stage 1)	187	36	\$227,303	\$(4,212,067)	\$56,826	\$(996,191)	\$(2,049,208)	\$(3,102,225)	\$(4,212,067)
Hazardous Organic NESHAP	365	147	\$922,641	\$(4,918,869)	\$230,660	\$(999,057)	\$(2,228,774)	\$(3,458,491)	\$(4,918,869)
Industrial Cooling Towers	33	12	\$75,446	\$(501,736)	\$18,862	\$(106,572)	\$(232,006)	\$(357,440)	\$(501,736)
Magnetic Tape	0	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Mercury Cell Chlor-Alkali Plants	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Natural Gas Transmission	83	40	\$251,488	\$(151,048)	\$62,872	\$25,110	\$(12,652)	\$(50,414)	\$(151,048)
Oil and Gas	106	51	\$320,647	\$(234,890)	\$80,162	\$21,439	\$(37,284)	\$(96,006)	\$(234,890)
Primary Copper	0	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Primary Magnesium Refining	1	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Pulp & Paper (non-combust) MACT	114	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
PVC	4	2	\$10,111	\$(53,905)	\$2,528	\$(10,949)	\$(24,425)	\$(37,901)	\$(53,905)
Refractory Products Manufacturing	8	4	\$25,353	\$(62,045)	\$6,338	\$(9,173)	\$(24,684)	\$(40,195)	\$(62,045)
Rubber Tire Manufacturing	21	12	\$74,089	\$(440,363)	\$18,522	\$(91,568)	\$(201,659)	\$(311,750)	\$(440,363)
Semiconductor Manufacturing	23	15	\$94,214	\$(610,184)	\$23,554	\$(128,992)	\$(281,538)	\$(434,084)	\$(610,184)
Spandex (GMACT II)	5	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
Utility Boilers	193	0	\$-	\$-	\$-	\$-	\$-	\$-	\$-
TOTALS for extrapolated source categories	1,294	330	\$2,068,885	\$(11,528,826)	\$517,221	\$(2,364,985)	\$(5,247,192)	\$(8,129,411)	\$(11,528,843)
Industrial, Commercial, Institutional Boilers and Process Heaters (3 source categories)									

Category	Facilities in Category Subject to MACT	Facilities With Emissions Below 125% of the MST	Permitting costs (2017\$)	Potential net compliance cost (savings) (2017\$)	Distribution of Cost and Savings Over a 5-Year Period (2017\$)				
					2021	2022	2023	2024	2025+
ICI Boilers and Process Heaters	1,821	814	\$5,117,773	\$(30,740,964)	\$1,279,443	\$(6,405,798)	\$(14,091,039)	\$(21,776,280)	\$(30,740,964)

Reciprocating Internal Combustion Engines (RICE) includes area sources									
Reciprocating Internal Combustion Engines (RICE) includes area sources*	4,205	0	\$4,558,213	\$-	\$1,139,553	\$1,139,553	\$1,139,553	\$1,139,553	\$-

*As explained in section 4.B.iv of this memo, permitting costs are estimated for RICE, but no cost savings are estimated. However, the permitting costs were not included in the total costs for all source categories.

\$19,540,989	\$(111,006,272)	Totals without the RICE category
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