



# **Guidance for Estimating VOC and NO<sub>x</sub> Emission Changes from MACT Rules**

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**GUIDANCE FOR ESTIMATING VOC AND NO<sub>x</sub> EMISSION  
CHANGES FROM MACT RULES**

U.S. Environmental Protection Agency  
Office of Air Quality Planning and Standards  
Air Quality Policy Division  
and  
Air Quality Assessment Division  
Research Triangle Park, North Carolina

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## **Acknowledgement**

This guidance document has been prepared by staff from the Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency. The document was developed under the direction of the Air Quality Policy Division in conjunction with the Air Quality Assessment Division and the Sector Policies and Programs Division. The draft report was prepared by E.H. Pechan & Associates, Inc. (through EPA Contract No. 68-D-00-283 Work Assignment No. 4-60). Questions concerning this document should be addressed to: Butch Stackhouse, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, C539-01, Research Triangle Park, North Carolina 27711 (email: Stackhouse.butch@epa.gov).

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## ACRONYMS AND ABBREVIATIONS

CAA	Clean Air Act
CAP	criteria air pollutant
CFR	Code of Federal Regulations
CO	carbon monoxide
EGU	electricity generating unit
EPA	United States Environmental Protection Agency
HAPs	hazardous air pollutants
IPM	Integrated Planning Model
MACT	maximum achievable control technology
MWC	municipal waste combustor
NEI	National Emissions Inventory
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>x</sub>	oxides of nitrogen
PM	particulate matter
RACT	reasonably achievable control technology
RFP	reasonable further progress
RICE	reciprocating internal combustion engines
SCC	source category classification
THC	total hydrocarbon
tpy	tons per year
TTN	Technology Transfer Network
VOC	volatile organic compound

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## 1.0. INTRODUCTION

EPA published final rules for the first phase of the rule to implement the 8-hour ozone standard (69 FR 23951) on April 30, 2004, and the second phase of the rule on November 29, 2005 (70 FR 71612). The phase 2 rule establishes procedures for demonstrating attainment in certain nonattainment areas and for meeting requirements under the Clean Air Act (CAA) for reasonably available control technology (RACT). EPA expects a number of areas to use 2002 as the baseline year for their attainment demonstrations. The final rule for phase 2 also establishes reasonable further progress (RFP) requirements, under which certain areas must obtain a specified percent reduction in emissions from a baseline year. EPA recommends that 2002 be the baseline year for RFP for the nonattainment areas whose designation effective date was June 15, 2004. Based on the CAA provision for RFP, EPA's phase 2 rule set forth RFP provisions for creditability of emission reductions that occur after the baseline.

In reviewing the public comments on the June 2, 2003 proposal, EPA recognized that nonattainment areas should be able to take credit for maximum achievable control technology (MACT) standards under section 112 of the CAA (which contains provisions for controlling air toxics) in meeting the above-mentioned requirements for the attainment demonstration, RACT and RFP. Certain MACT standards (40 CFR 63) for which compliance is required after the 2002 baseline year are expected to reduce volatile organic compounds (VOC) or oxides of nitrogen (NO<sub>x</sub>). This document provides estimates of the expected VOC and NO<sub>x</sub> reductions associated with implementation of individual MACT standards with post-2002 compliance dates.

Even though EPA had recommended the use of a 2002 baseline emission inventory, the Phase 2 rule also allows for alternative baseline years. Therefore, if a baseline year after 2002 is used, the use of information concerning MACT compliance periods provided in this document will have to reflect the baseline year used in the SIP (e.g., if a compliance period of a MACT standard is 2003, but the baseline year in the SIP is 2005, the emission reductions from the MACT should be reflected in the baseline year and not as an additional credit after the baseline year.)

### 1.1 What is the Purpose of This Document?

This document is intended to help States prepare their emission projections by providing the information needed to determine the level of VOC and NO<sub>x</sub> reductions expected with the implementation of post-2002 MACT standards where source-specific estimates are not practical for a source category in an 8-hour ozone nonattainment area. The States can assume the national average percent reduction provided in this document to estimate emission reductions for a given MACT standard. Although the MACT standards address hazardous air pollutants (HAPs), and indirectly affect criteria pollutants such as particulate matter (PM), this document only addresses the ozone precursor pollutants VOC and NO<sub>x</sub>.

The reader should note that the reductions described in this document are national estimates. States are advised to calculate the reductions expected with the post-2002 MACT standards based on the state's source-specific information where an assessment of sources in the emission inventory is practical. States and Regional Planning Organizations have reviewed MACT reductions for facilities in their regions which is a preferred approach to using national estimates.

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## 1.2 Who is the Audience?

State, local, and tribal air quality staff who are developing nonattainment plans to achieve the 8-hour ozone national ambient air quality standard can use this document to determine if and how the expected emission reductions from the post-2002 MACT standards apply to their emission projections.

## 1.3 How is This Document Organized?

This document is organized in three chapters and an appendix. Chapter 1 is this *Introduction*. Chapter 2, *Analysis and Results of MACT Emissions Reductions* discusses how EPA developed the emissions reductions and presents two summary tables. Table 1 presents the post-2002 MACT standards and their expected VOC and NO<sub>x</sub> percent reduction. Table 2 lists the post-2002 MACT standards with no expected VOC or NO<sub>x</sub> reductions. Chapter 3, *How to Use the Information in Emissions Projections* provides information and sample calculations that show how to calculate future year emission inventories. Informational tables for the post-2002 MACT standards that are expected to reduce NO<sub>x</sub> and/or VOC emissions are presented in Appendix A.

## 1.4 Where Can I Get Additional Information?\*

Throughout this document, the reader is referred to additional information where available. See Appendix A of this document for references to reports and web sites that relate specifically to each MACT standard. EPA project leaders associated with each MACT standard are listed in EPA's Air Toxic website at <http://www.epa.gov/ttn/atw/mactfnlalph.html>.

## 2.0 ANALYSIS AND RESULTS OF MACT EMISSIONS REDUCTIONS

### 2.1 How were the Emissions Reductions Developed?

During the MACT standard setting process, EPA developed HAP reduction estimates, and in some cases, the associated VOC reduction expected from the National Emission Standards for Hazardous Air Pollutants (NESHAP). Note that not all HAP reductions result in VOC reductions (i.e., VOC reductions may be less than the HAP reduction). Also, in some cases VOC reductions may be greater than the HAP reduction. The estimated VOC reductions take into account the composition of the source's HAP emissions and the expected emission control selections for MACT compliance.

Table 1 presents VOC and NO<sub>x</sub> control efficiencies for those MACT standards expected to result in emission reductions for one or both pollutants. The table lists each MACT standard, and includes the associated MACT code, Code of Federal Regulations (CFR) subpart, and compliance date. Control efficiencies are presented for VOC and NO<sub>x</sub>, expressed as a percent of the pre-MACT emission levels. These control efficiencies represent national average expected emission reductions for a source category. Finally, the source applicability field indicates whether a MACT standard applies to major sources only or both major and area sources.

For several surface coating category MACT standards, Table 1 does not include estimates of the expected VOC reductions, due to the uncertainty of the compliance method that will be selected.

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For these standards, the majority of the facilities are expected to comply through the reformulation of existing coatings to low or no-HAP containing coatings. It cannot be predicted whether these reformulated materials will result in actual VOC emission reductions. These categories include:

- Large Appliances (subpart NNNN)
- Metal Furniture (subpart RRRR)
- Miscellaneous Metal Parts and Products (subpart MMMM)
- Plastic Parts Surface Coating (subpart PPPP)

EPA recommends that States identify the facilities impacted by these four surface coating category MACT standards, consider the expected compliance methods used (e.g., add-on controls or reformulation), and the VOC reductions that are likely to be achieved. In cases where the compliance method used is not known or cannot be determined, EPA recommends that States assume a conservative or zero emission reduction resulting from these standards. States should also consider though, that for areas newly designated nonattainment under the 8-hour ozone standard, surface coaters covered by these four MACT standards may also be newly subject to a VOC reasonably achievable control technology (RACT) requirement, which would require limits on the actual VOC emissions. Many standards do not have primary, or on-site, impacts that affect NO<sub>x</sub> emissions. In cases where an increase in NO<sub>x</sub> emissions is expected due to the use of an add-on control, such as a thermal or catalytic oxidizer, this is indicated with the note "+". EPA was not able to reasonably quantify this percentage increase. Depending on the compliance option chosen by a facility, this increase may be zero or minimal. For reference, in the regulatory impact analysis for the Plywood and Composite Wood Products MACT, EPA estimated a maximum 10 percent increase in baseline NO<sub>x</sub> emissions associated with use of a regenerative thermal oxidizer (based on vendor performance data). This value may vary depending in the actual operation of the control equipment. In addition, all air pollution control devices require electricity to operate. NO<sub>x</sub> emission increases at electricity generating units (EGUs) are not quantified for this guidance. Furthermore, due to existing caps on NO<sub>x</sub> emissions from EGUs in some regions, secondary air emissions of NO<sub>x</sub> associated with offsite electricity production would not result in a net increase.

Post-2002 MACT standards not listed in Table 1 are not expected to result in VOC reductions. In most cases, these standards only address sources of particulate or non-volatile organic HAPs. For some of the standards, the limits only apply to new sources, which would not be included in a 2002 baseline, and would already reflect controlled emissions once they started operation. States should note that compliance with these standards may result in small NO<sub>x</sub> increases depending on whether an add-on control device is used. For reference, these NESHAPs are listed in Table 2.

## **2.2 What Does Appendix A Contain?**

Appendix A contains informational tables for each NESHAP for which EPA was able to develop VOC and/or NO<sub>x</sub> emission reductions (i.e., each category in Table 1). Each table lists the NESHAP category and other descriptive information, as well as the expected VOC and NO<sub>x</sub> emission reduction percentage, or control efficiency. The "Comments" section describes the basis and rationale for the values presented for each category.

Resources to assist States in identifying those specific facilities/sources affected by each NESHAP are also provided, where available. Note that where lists of affected facilities are

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provided by EPA, these may be outdated and not contain all subject facilities, or facilities identified may no longer be subject due to operational changes and other factors. See also sections 3.4 and 3.5 for additional discussion of identifying facilities affected by MACT standards. Lastly, the informational table lists the reference(s) used in deriving the emission reduction percentages.

**Table 1. Post-2002 MACT Standards and Expected VOC and NO<sub>x</sub> Reductions <sup>1</sup>**

MACT Standard - Source Category	MACT Code	40 CFR 63 Subpart	Compliance Date	National VOC (Percent Reduction)	National NO <sub>x</sub> (Percent Reduction)	Source Applicability
Asphalt Processing and Asphalt Roofing Manufacturing	0418	LLLLL	05/01/06	85	+	Major
Auto and Light Duty Truck Surface Coating	0702	IIII	04/26/07	28	+	Major
Boat Manufacturing	1305	VVVV	08/22/04	32	0	Major
Carbon Black Production (Generic MACT)	1415	YY	07/12/05	83	+	Major
Cellulose Products	1349	UUUU	06/11/05	12	+	Major
Combustion Sources at Kraft, Soda, and Sulfite Pulp & Paper Mills	1626-2	MM	01/12/04	12	+	Major
Cyanide Chemical Manufacturing (formerly Cyanuric Chloride Production) (Generic MACT)	1405	YY	07/12/05	44	+	Major
Ethylene Processes (Generic MACT)	1635	YY	07/12/05	64	+	Major
Fabric Printing, Coating, & Dyeing	0713	OOOO	05/29/06	60	+	Major
Friction Products Manufacturing	1636	QQQQQ	10/18/05	44	0	Major
Iron and Steel Foundries	0308	EEEEEE	04/22/07	5	0	Major
Leather Finishing Operations	1634	TTTT	02/27/05	51	0	Major
Manufacturing Nutritional Yeast (formerly Bakers Yeast)	1101	CCCC	05/21/04	10	0	Major
Metal Can Surface Coating	0707	KKKK	11/13/06	70	+	Major
Metal Coil Surface Coating	0708	SSSS	06/10/05	53	+	Major
Misc. Coating Manufacturing	1642	HHHHH	12/11/06	64	+	Major
Misc. Organic Chemical Production and Processes (MON)	1641	FFFF	11/10/06	69	+	Major
Municipal Solid Waste Landfills	0802	AAAA	1/16/04	75	0	Major & Area
Organic Liquids Distribution (Non-gasoline)	0602	EEEE	02/03/07	70	+	Major
Paper and Other Web Surface Coating	0711	JJJJ	12/04/05	80	+	Major
Pesticide Active Ingredient Production	0911	MMM	12/23/03	65	+	Major
Petroleum Refineries	0502	UUU	04/11/05	57	+	Major

<b>MACT Standard - Source Category</b>	<b>MACT Code</b>	<b>40 CFR 63 Subpart</b>	<b>Compliance Date</b>	<b>National VOC (Percent Reduction)</b>	<b>National NO<sub>x</sub> (Percent Reduction)</b>	<b>Source Applicability</b>
Plywood and Composite Wood Products (formerly Plywood and Particle Board Mfg.)	1624	DDDD	10/1/07	54	+	Major
Polymers & Resins III	1347	OOO	01/20/03	51	0	Major
Refractory Products Manufacturing	0406	SSSS	04/17/06	81	+	Major
Reinforced Plastic Composites Production	1337	WWWW	04/21/06	39	+	Major
Rubber Tire Manufacturing	1631	XXXX	07/11/05	52	0	Major
Site Remediation	0805	GGGG	10/08/06	50	0	Major
Solvent Extraction for Vegetable Oil Production	1103	GGGG	04/12/04	25	0	Major
Wet Formed Fiberglass Mat Production	0413	HHHH	04/11/05	74	+	Major
Wood Building Products Surface Coating (formerly Flat Wood Paneling Products)	0703	QQQQ	05/28/06	63	0	Major

+ = an increase in NO<sub>x</sub> emissions is expected due to the use of an add-on control

<sup>1</sup> These National VOC and NO<sub>x</sub> control efficiencies represent national average expected emission reductions for a source category.

**Table 2. Post-2002 MACT Standards With No Expected VOC or NO<sub>x</sub> Reductions**

<b>MACT Standard - Source Category</b>	<b>MACT Code</b>	<b>40 CFR 63 Subpart</b>	<b>Compliance Date</b>
Brick and Structural Clay Products Manufacturing	0414	JJJJJ	05/16/06
Clay Ceramics Manufacturing	0415	KKKKK	05/16/06
Coke Ovens: Pushing, Quenching, & Battery Stacks	0303	CCCCC	04/14/06
Combustion Turbines (Stationary)	0108	YYYYY	03/05/07
Engine Test Cells/Strands (Combined with Rocket Testing Facilities)	0101	PPPPP	See FR
Flexible Polyurethane Foam Fabrication Operations	1314	MMMMM	04/14/04
Hazardous Waste Combustion	0801	Parts 63, 261, and 270	09/30/03
Hydrochloric Acid Production	1407	NNNNN	04/17/06
Industrial, Commercial, and Institutional Boilers and Process Heaters	0107	DDDDD	09/13/07
Integrated Iron and Steel	0305	FFFFF	05/20/06
Lime Manufacturing	0408	AAAAA	01/05/07
Mercury Cell Chlor-Alkali Plants (formerly Chlorine Production)	1403	IIIII	12/19/06
Polyvinyl Chloride and Copolymers Production	1336	J	07/10/05
Primary Copper	0203	QQQ	06/12/05
Primary Magnesium Refining	0207	TTTTT	10/10/04
Reciprocating Internal Combustion Engines (RICE) (NESHAP/NSPS)	0105	ZZZZZ	06/15/07
Secondary Aluminum	0202	RRR	03/24/03
Semiconductor Manufacturing	1629	BBBBB	05/22/06
Spandex Production (Generic MACT)	1003	YY	07/12/05
Taconite Iron Ore Processing	0411	RRRRR	10/30/06

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## **3.0 HOW TO USE THE INFORMATION IN EMISSIONS PROJECTIONS**

### **3.1 How Do I Use This Document to Determine Emission Reductions and Develop Emission Projections?**

Future year emission rates for many source sectors are maintained in sector-specific models (e.g., EGU emission rates in Integrated Planning Model (IPM); onroad mobile source rates in MOBILE, and nonroad mobile source rates in NONROAD). Because no emission estimation model has been developed for the non-EGU stationary point and nonpoint sectors, no single resource provides future year emission rates for these sectors. To assist in identifying appropriate future year stationary source control assumptions, Table 1 provides information about the expected effects of post-2002 MACT standards on VOC and NO<sub>x</sub> emissions.

Section 112 of the CAA requires EPA to establish NESHAPs for the control of HAP from both new and existing major sources. The CAA requires the NESHAP to reflect the maximum degree of reduction in HAP emissions that is achievable. The MACT standards for existing sources cannot be less stringent than the average emission limitation achieved by the best performing 12 percent of existing sources in the category or subcategory (or the best performing five sources for categories with fewer than 30 sources). So, for any MACT standard issued, there will always be sources that are already meeting the requirements, although they might not be located in every State.

The values provided for VOC and NO<sub>x</sub> in Table 1 are the national average emission reductions post-2002 for the affected source category. This value already takes into account that some sources already meet the MACT requirements and some do not. Use of the VOC and NO<sub>x</sub> control efficiencies presented in Table 1 is an appropriate method to apply where a State or local air agency does not have site-specific information about whether a MACT standard applies.

The remainder of this section discusses how to identify affected facilities and use source-specific data for estimating the expected reductions. This section also provides an example calculation for estimating future year emissions that account for MACT standard reductions.

### **3.2 How Do I Identify Affected Facilities?**

Resources that can be used to identify sources affected by individual MACT standards include consulting lists developed by EPA during the standard setting process, using the State/local/tribal agencies' own evaluation of applicability, or using the MACT codes in the EPA National Emission Inventory (NEI) point source file. Procedures for using information in the NEI are described below. The current NEI files and explanation for using the files are available at <http://www.epa.gov/ttn/chief/net/>

The EPA's NEI contains emission estimates for major sources, area (or non-point) sources, and mobile sources. Point sources in the NEI are sources for which the specific location is known; they may be either major or area sources. The Clean Air Act defines major sources of HAPs as: facilities that have the potential to emit 10 tons/year of single HAP or 25 tons or more/year of

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multiple HAPs. Facilities that have the potential to emit less than 10 tons/year of a single HAP or less than 25 tons/year of multiple HAPs are defined as area sources. Point sources in the NEI have each been identified as either major or area, based on data received from State/local/tribal agencies and EPA staff.

To evaluate EPA's progress in reducing air toxic emissions through the MACT standards and to identify sources that may be modeled as part of residual risk assessments, operations within facilities that are subject to MACT standards are identified in the NEI by 6-digit MACT codes. The tagging of data with MACT codes allows EPA to determine reductions attributable to the MACT program. The NEI associates MACT codes corresponding to MACT source categories with stationary major and area source data. MACT codes are assigned at the process level. MACT codes are also assigned to source categories in the non-point source file. Most NEI emissions associated with MACT categories are present in the point source inventory.

The NEI point source files are available at <http://www.epa.gov/ttn/chief/net/>. Where applicable, facilities in the NEI point source inventory are identified by a Process MACT code, as well as a variety of facility identifiers, for example facility name, facility ID from the data source (State/local tribal agency or TRI), and location information (address, State and county FIPs codes, latitude/longitude). For facilities with MACT codes of interest, States/locals/tribes can match those facilities to information in their emission inventories using the facility identifiers in the NEI. If the facility in the NEI is based on data submitted by a State/local/tribal agency, a match can be made using the facility ID which should be the same in both inventories. If the facility in the NEI is based on data from another source, then a match can be made using the other facility identifier data (i.e., name, location). After review of these records, States would then determine and apply the appropriate emission reductions, either based on this document, or their own information as discussed in the next section.

### **3.3 Source-Specific Data versus National Averages**

The preferred approach, where practical, is to use site-specific data to estimate emission reductions for a given MACT standard. When source-specific estimates are practical for only some sources, the States are advised to use source-specific estimates where available and assume for the remaining other sources: (A) no additional control (0%) for already controlled sources, (B) the specific add-on control device percent reduction, or (C) the national average percent reduction. Where source-specific estimates are not practical for any member of a source category in an area, the States are advised to assume the national average percent reduction provided in this document. The States should use their judgment when applying a national average for some sources and developing site-specific information for other sources affected by the same MACT standard since the national average is intended to reflect all sources.

The approach to applying a national average control efficiency to the applicable source category classifications (SCCs) in the emission database is to identify whether individual facilities and sources are likely to be affected by the MACT standard. For the sources to which any individual MACT applies, the preferred method for estimating potential future year emission changes is to identify the requirements for individual source types within the source category, and to compare those requirements with the emissions performance/emission controls currently in-place. If the MACT standard requirement is more stringent than the controls that are in-place, the expected change in emission rates when the source is in compliance with the MACT standard needs to be

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accounted for in any emission projections. For each affected source, the likely control requirement and associated change in emission rate can be identified and expressed as a control efficiency. This control efficiency may represent a change in emissions from uncontrolled levels, or in addition to existing controls.

### 3.4 Major Source/Area Source Applicability

Section 112 of the CAA defines major sources of HAP as those sources that emit 10 tons or more annually of a single HAP, or 25 tons or more annually of a combination of HAPs. Area sources are sources emitting HAPs below these major source thresholds. MACT standards within many of the NESHAP typically only apply to major sources, though there are some exceptions. Table 1 indicates whether a MACT standard applies to major sources only, or both major and area sources (i.e., for municipal solid waste landfills). In cases where the NESHAP sets MACT limits for both major and area sources, VOC reductions should also be applied to applicable area source SCCs in a State's inventory.

Under the Urban Area Toxics Program, EPA is required to regulate 70 area source categories identified as significantly contributing to a list of 30 priority HAPs. Of these 70 categories, a small subset has already been addressed under existing NESHAPs. Standards for the remaining area source categories are either under development or will be developed in the future by EPA. As these are finalized, States should consider whether these standards may result in additional VOC reductions for the area source portion of their inventory. See EPA's Urban Air Toxics Strategy web site at <http://www.epa.gov/ttn/atw/urban/arearules.html>, for more information. In addition, EPA is required to assess post-MACT risk from source categories and set additional "residual risk" standards as needed for major sources

### 3.5 Example Calculations

This section provides an example calculation for the petroleum refinery sources that are affected by Subpart UUU in the CFR. Table 1 provides estimates that the national average VOC emission reduction for the catalytic cracking and catalytic reforming sources in the 2002 base year emission inventory will be 43 percent. If an ozone nonattainment area that has these sources is making an emission projection for 2009, and the activity indicator shows that source activity is expected to increase by 15 percent from 2002 to 2009, then the expected 2009 VOC emissions can be estimated as follows (this example assumes 100 percent rule effectiveness and 100 percent rule penetration for simplicity):

$$2009 \text{ VOC emissions} = 2002 \text{ emissions } (1-CE) (GF)$$

where:

CE = control efficiency

GF = growth factor

For a catalytic cracking unit that emits 250 tons per year (tpy) of VOC emissions in 2002, the 2009 VOC emissions calculation is:

$$\begin{aligned} 2009 \text{ VOC emissions} &= (250 \text{ tpy VOC}) (1-0.43) (1.15) \\ 2009 \text{ VOC emissions} &= 163.875 \text{ tpy} \end{aligned}$$

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Note that the 2002 base year emissions represent a pre-MACT, average existing control level. The table below shows how this calculation might occur for SCC-level emissions at an example facility in the emission inventory.

<b>SCC</b>	<b>SCC Description</b>	<b>2002 tpy VOC Emissions</b>	<b>CE</b>	<b>GF</b>	<b>2009 tpy VOC Emissions</b>
30600201	Catalytic cracking	250	0.43	1.15	163.875
30601601	Catalytic reforming	150	0.43	1.15	98.325
<b>Facility Total</b>		<b>400</b>			<b>262</b>

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## APPENDIX A. AT-A-GLANCE TABLES FOR MACT SOURCE CATEGORIES FOR WHICH VOC AND NO<sub>x</sub> REDUCTIONS ARE EXPECTED

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**Table A-1. Asphalt Processing and Asphalt Roofing Manufacturing**

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SOURCE CATEGORY: Asphalt Processing and Asphalt Roofing Manufacturing  
MACT CODE: 0418

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FEDERAL REGISTER CITATION: 68FR24561  
40 CFR 63 SUBPART: LLLLL

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 05/01/06

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	85	+

COMMENTS: The final rule establishes emission limits for two pollutants, total hydrocarbons and particulate matter, each of which serves as a surrogate for HAPs emitted by the process equipment. The final rule will reduce gaseous and particulate air toxics emitted at a number of points at these facilities, including blowing stills, asphalt storage tanks, asphalt loading operations, coating mixers, coaters, saturators, wet loopers, and applicators. The preamble to the final rule estimates that national baseline total hydrocarbon (THC) emissions from major point sources of 605 tons per year can be reduced by 512 tons per year via this emission standard. This is equal to an 85 percent THC emission reduction. Because the likely emission controls are combustion controls, it is expected that VOC emission reductions will be the same as the expected THC emission reductions (on a percentage basis). Compliance with this emission standard is expected to occur by installing add-on controls. Though not quantified by EPA, add-on controls such as thermal or catalytic oxidizers contribute to on-site NO<sub>x</sub> emission increases (+).

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ADDITIONAL INFORMATION: See <http://www.epa.gov/ttn/atw/asphalt/sources.html> for a list of sources that may be used as an initial screening tool to identify affected sources in each State.

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REFERENCES:

68 FR 24561, 2003: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Asphalt Processing and Asphalt Roofing Manufacturing; Final Rule; Republication," Vol. 68, pg. 24561, 2003. Retrieved March 22, 2005 from: <http://www.epa.gov/ttn/atw/asphalt/fr07my03.pdf>

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## Table A-2. Auto and Light-Duty Truck Surface Coating

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SOURCE CATEGORY: Auto and Light-Duty Truck Surface Coating  
MACT CODE: 0702

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FEDERAL REGISTER CITATION: 69FR22601  
40 CFR 63 SUBPART: IIII

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 04/26/07

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	28	+

COMMENTS: Emissions from coating application, drying, and curing account for most of the HAP emissions from automobile and light-duty truck surface coating operations. The remaining emissions are from booth and equipment cleaning, and mixing and storage. The primary HAP emitted by these operations are toluene, xylene, glycol ethers, methyl ethyl ketone, methyl isobutyl ketone, ethyl benzene, and methanol. The preamble to the final rule estimates that national baseline VOC emissions of 53,000 can be reduced nationwide by 12,000 to 18,000 tons per year via this emission standard. Assuming the mid-point of this range, this is equal to a 28 percent VOC emission reduction. Compliance with this emission standard is expected to occur by a combination of substituting non-HAP VOC for HAP VOC, switching to materials lower in both HAP and VOC, improving transfer efficiency and installing add-on controls. Though not quantified by EPA, add-on controls such as thermal or catalytic oxidizers contribute to on-site NO<sub>x</sub> emission increases (+).

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ADDITIONAL INFORMATION: See <http://www.epa.gov/ttn/atw/auto/autosource.pdf> for a list of auto and light-duty truck surface coating sources that may be used as an initial screening tool to identify affected sources in each State.

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### REFERENCES:

69 FR 22601, 2004: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Surface Coating of Automobiles and Light-Duty Trucks; Final Rule," Vol. 60, pg. 22601, 2004. Retrieved March 17, 2005 from:  
<http://www.epa.gov/ttn/atw/auto/fr26ap04r.pdf>

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### Table A-3. Boat Manufacturing

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SOURCE CATEGORY: Boat Manufacturing  
MACT CODE: 1305

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FEDERAL REGISTER CITATION: 66 FR 44217  
40 CFR 63 SUBPART: VVVV

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 08/22/04

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	32	0

COMMENTS: The final rule contains emissions limitations for HAPs such as styrene, methyl methacrylate, methylene chloride, toluene, and xylene. Processes regulated include fiberglass resin and gel coat operations, carpet and fabric adhesive operations, and aluminum recreational boat painting operations. The preamble to the final rule estimates that national HAP emissions of 9,920 tons per year (tpy) can be reduced by 3,450 tpy via this emission standard. Methylene chloride (by EPA's definition is exempt as a VOC) comprises 420 tons of the total HAP, 100 percent of which is controlled under this standard. The remaining HAP emissions are VOCs. From an adjusted VOC emissions baseline of 9,500 tpy, VOC emissions will be reduced by 3,030 tpy. This is equal to a 32 percent VOC emission reduction. Compliance with this emission standard is expected to occur by use of low HAP resins and gel coats and use of non-atomized resin spray application systems.

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ADDITIONAL INFORMATION: A map that identifies the location of potentially affected sources can be found at: <http://www.epa.gov/ttn/atw/boat/map.pdf>.

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REFERENCES:

66 FR 44217, 2001: *Federal Register*, "National Emission Standards for Boat Manufacturing; Final Rule," Vol. 66, pg. 44217, 2001. Retrieved on March 22, 2005 from <http://www.epa.gov/ttn/atw/boat/fr22au01.pdf>.

Barnett, 2005: Keith Barnett, SPPD, OAQPS, U.S. EPA, personal communication of Project Tracking System data with J. Silvasi and D. Gerth, AQSSD, OAQPS, U.S. EPA, and K. Thesing, E.H. Pechan & Associates, Inc., March 22, 2005.

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**Table A-4. Carbon Black Production**

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SOURCE CATEGORY: Carbon Black Production (Generic MACT)

MACT CODE: 1415

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FEDERAL REGISTER CITATION: 67FR46257

40 CFR 63 SUBPART: YY

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 07/12/05

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	83	+

COMMENTS: The final rule identifies carbon black production as a major source of HAPs, including cyanide compounds, acrylonitrile, acetonitrile, carbonyl sulfide, carbon disulfide, benzene, and toluene. The preamble to the final rule estimates that national baseline VOC emissions of 22,434 tons per year will be reduced by 18,600 tons per year via this emission standard. This is equal to an 83 percent VOC emission reduction. Sources are expected to comply with this emission standard through the use of flares. Though not quantified by EPA, add-on controls such as flares contribute to on-site NO<sub>x</sub> emission increases (+).

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REFERENCES:

67 FR 46257, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Generic Maximum Achievable Control Technology; Final Rules and Proposed Rule," Vol. 67, pg. 46257, 2002. Retrieved March 22, 2005 from: <http://www.epa.gov/ttn/atw/gmact/fr12jy02a.pdf>

Barnett, 2005: Keith Barnett, SPSD, OAQPS, U.S. EPA, personal communication of Project Tracking System data with J. Silvasi and D. Gerth, AQSSD, OAQPS, U.S. EPA, and K. Thesing, E.H. Pechan & Associates, Inc., March 22, 2005.

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### Table A-5. Cellulose Products Manufacturing

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SOURCE CATEGORY: Cellulose Products Manufacturing  
MACT CODE: 1349

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FEDERAL REGISTER CITATION: 67 FR 40043  
40 CFR 63 SUBPART: UUUU

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 06/01/02

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	12	+

COMMENTS: The final rule will reduce emissions of carbon disulfide, carbonyl sulfide, and toluene from viscose process operations and ethylene oxide, methanol, methyl chloride and propylene oxide from cellulose ether operations. The preamble to the final rule estimates that national VOC baseline emissions of 14,100 tons per year can be reduced by 1,700 tons per year nationwide via this emission standard. This is equal to a 12 percent VOC emission reduction. Compliance with this emission standard is expected to occur by installing thermal oxidizer add-on controls which contribute to on-site NO<sub>x</sub> emission increases (+).

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REFERENCES:

67 FR 40043, 2002: *Federal Register*, "National Emission Standards: Cellulose Products Manufacturing; Final Rule," Vol. 67, pg.40043, 2002. Retrieved April 8, 2005 from <http://www.epa.gov/ttn/atw/cellulose/fr11jn02.pdf>

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**Table A-6. Combustion Sources at Kraft, Soda, and Sulfite Pulp and Paper Mills**

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SOURCE CATEGORY: Combustion Sources at Kraft, Soda, and Sulfite Pulp and Paper Mills  
MACT CODE: 1626-2

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FEDERAL REGISTER CITATION: 66FR3180  
40 CFR 63 SUBPART: MM

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 01/12/04

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	12	+

COMMENTS: The affected sources that are regulated by the final rule include recovery furnaces, lime kilns, sulfite combustion units, semi-chemical combustion units, and chemical recovery systems. HAPs that are regulated by this standard include both gaseous organic and metal HAPs. The preamble to the final rule estimates that national baseline HAP emissions of 22,500 tons per year can be reduced by approximately 2,700 tons per year via this emission standard. This is equal to a 12 percent HAP emission reduction. Most HAPs identified are also VOCs, so using this reduction figure is reasonable for VOC reductions. Compliance with this emission standard is likely to occur by the use of thermal oxidizer add-on controls. These controls are expected to result in a slight increase in NO<sub>x</sub> emissions.

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ADDITIONAL INFORMATION: See <http://www.epa.gov/ttn/atw/pulp/milltab.pdf> for a list of pulp and paper mills subject to combined air and water rules that may be used as a screening tool for identifying affected sources in each State.

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REFERENCES:

66 FR 3180, 2001: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills; Final Rule," Vol. 66, pg. 3180, 2001. Retrieved March 22, 2005 from: [http://www.epa.gov/ttn/oarpg/t3/fr\\_notices/pp\\_fr4.pdf](http://www.epa.gov/ttn/oarpg/t3/fr_notices/pp_fr4.pdf)

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### Table A-7. Cyanide Chemical Manufacturing

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SOURCE CATEGORY: Cyanide Chemical Manufacturing (formerly Cyanuric Chloride Production)  
(Generic MACT)

MACT CODE: 1405

FEDERAL REGISTER CITATION: 67FR46257

40 CFR 63 SUBPART: YY

SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 07/12/05

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	44	+

COMMENTS: The final rule identifies cyanide chemical manufacturing as a major source of HAPs, including cyanide compounds, acrylonitrile, acetonitrile, carbonyl sulfide, carbon disulfide, benzene, 1,3-butadiene, toluene, and 2,4-toluene diisocyanate. The preamble to the final rule estimates that national VOC emissions of 260 tons per year will be reduced by 113 tons per year via this emission standard. This is equal to a 44 percent VOC emission reduction. Compliance with this emission standard is expected to occur by installing add-on controls such as thermal oxidizers and flares, which contribute to on-site NO<sub>x</sub> emission increases (+).

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REFERENCES:

67 FR 46257, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Generic Maximum Achievable Control Technology; Final Rules and Proposed Rule," Vol. 67, pg. 46257, 2002. Retrieved March 22, 2005 from:  
<http://www.epa.gov/ttn/atw/gmact/fr12jy02a.pdf>

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### Table A-8. Ethylene Processes

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SOURCE CATEGORY: Ethylene Processes (Generic MACT)  
MACT CODE: 1635

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FEDERAL REGISTER CITATION: 67FR46257  
40 CFR 63 SUBPART: YY

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 07/12/05

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	64	+

COMMENTS: The final rule identifies ethylene processes as a major source of HAPs, including cyanide compounds, acrylonitrile, acetonitrile, carbonyl sulfide, carbon disulfide, benzene, 1,3-butadiene, toluene, and 2,4 toluene diisocyanate. The following emission types are the primary sources of emissions covered by the final rule: Equipment such as pumps, compressors, pressure relief devices, valves, and connectors; storage vessels; transfer racks; process vents; heat exchange systems; and waste operations. The preamble to the final rule estimates that national baseline VOC emissions of 15,900 tons per year will be reduced by 10,188 tons per year via this emission standard. This is equal to a 64 percent VOC emission reduction. Compliance with this emission standard is likely to occur by the use of combustion devices or flares. These control techniques are expected to increase NO<sub>x</sub> emissions.

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REFERENCES:

67 FR 46257, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Generic Maximum Achievable Control Technology; Final Rules and Proposed Rule," Vol. 67, pg. 46257, 2002. Retrieved March 22, 2005 from:  
<http://www.epa.gov/ttn/atw/gmact/fr12jy02a.pdf>

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## Table A-9. Fabric Printing, Coating, and Dyeing

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SOURCE CATEGORY: Fabric Printing, Coating, and Dyeing  
MACT CODE: 0713

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FEDERAL REGISTER CITATION: 68FR32171  
40 CFR 63 SUBPART: OOOO

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 05/29/06

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	60	+

COMMENTS: This rule sets emissions limits for all fabric and other textile coating or printing lines, dyeing, finishing, or slashing operations. The final rule will reduce emissions for the following HAPs: toluene, methyl ethyl ketone, methanol, xylenes, methyl isobutyl ketone, methylene chloride, trichloroethylene, n-hexane, glycol ethers, and formaldehyde. The preamble to the final rule estimates that national baseline organic HAP emissions of 6,800 tons per year can be reduced by 4,100 tons per year HAP via this emission standard. This is equal to a 60 percent HAP emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction. Compliance with this emission standard is expected to occur by installing add-on controls. Though not quantified by EPA, add-on controls such as thermal or catalytic oxidizers contribute to on-site NO<sub>x</sub> emission increases (+).

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ADDITIONAL INFORMATION: See <http://www.epa.gov/ttn/atw/fabric/fabricfacilities.pdf> for a list of potentially affected sources that may be used as an initial screening tool to identify affected sources in each State.

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### REFERENCES:

68 FR 32171, 2003: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Printing, Coating, and Dyeing of Fabrics and Other Textiles; Final Rule," Vol. 68, pg. 32171, 2003. Retrieved March 17, 2005 from:  
<http://www.epa.gov/ttn/atw/fabric/fr29my03r.pdf>

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**Table A-10. Friction Products Manufacturing**

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SOURCE CATEGORY: Friction Products Manufacturing  
MACT CODE: 1636

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FEDERAL REGISTER CITATION: 66FR64497  
40 CFR 63 SUBPART: QQQQQ

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 10/18/05

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	44	0

COMMENTS: The final rule will reduce air toxics emitted by solvent mixers used in some friction materials manufacturing processes. The final rule establishes emission limits for n-hexane, toluene, and trichloroethylene. Facilities are expected to comply with the rule's requirements by using a solvent recovery system that would capture and reclaim solvent used in the manufacturing process. The preamble to the final rule estimates that baseline organic HAP emissions of approximately 660 tons per year can be reduced by 290 tons per year nationwide via this emission standard. This is equal to a 44 percent HAP emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction.

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REFERENCES:

66 FR 64497, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants for Friction Materials Manufacturing Facilities; Final Rule," Vol. 66, pg. 64497, 2002. Retrieved March 17, 2005 from: <http://www.epa.gov/ttn/atw/friction/fr18oc02.pdf>

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**Table A-11. Iron and Steel Foundries**

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SOURCE CATEGORY: Iron and Steel Foundries  
MACT CODE: 0308

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FEDERAL REGISTER CITATION: 69 FR 21905  
40 CFR 63 SUBPART: EEEEE

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 04/22/07

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	5	0

COMMENTS: The final rule establishes emission limits for HAPs including benzene, chromium, dioxin, lead, manganese, mercury, methanol, nickel, and triethylamine. This rule affects those iron and steel foundries that melt scrap, ingot, and other forms of iron and steel and pour the resulting molten metal into molds to produce shaped products, most of which are operated by automobile and large industrial equipment manufacturers and suppliers. EPA estimates that the national VOC baseline emissions of 16,400 tons per year can be reduced by 820 tons per year via this emission standard by product substitution for binders. This is equal to a 5 percent VOC emission reduction.

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ADDITIONAL INFORMATION: A map detailing the number of affected foundries per State can be found in Figure 2.5 of the "Economic Impact Analysis of Final Iron and Steel Foundries NESHAP" report located at: [http://www.epa.gov/ttn/atw/ifoundry/foundry\\_report.pdf](http://www.epa.gov/ttn/atw/ifoundry/foundry_report.pdf)

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REFERENCES:

Cavender, 2005: K. Cavender, SPSD, OAQPS, U.S. EPA, personal communication with K. Thesing, E.H. Pechan & Associates, Inc., March 29, 2005.

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## Table A-12. Leather Finishing Operations

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SOURCE CATEGORY: Leather Finishing Operations  
MACT CODE: 0704

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FEDERAL REGISTER CITATION: 67FR9155  
40 CFR 63 SUBPART: TTTT

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 02/27/05

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	51	0

COMMENTS: The final rule identifies leather finishing operations as major sources of emissions of HAPs, such as glycol ethers, toluene, and xylene. The emission standards limit the number of pounds of HAP lost per square foot of leather processed. The preamble to the final rule estimates that national VOC emissions of 1,470 tons per year from leather finishing operations can be reduced nationwide by 750 tons per year via this emission standard. This is equal to a 51 percent VOC emission reduction. Compliance with this emission standard is expected to occur by process control.

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REFERENCES:

67 FR 9155, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants for Leather Finishing Operations; Final Rule," Vol. 67, pg. 9155, 2002. Retrieved March 17, 2005 from: <http://www.epa.gov/ttn/atw/leather/fr27fe02.pdf>

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**Table A-13. Manufacturing Nutritional Yeast**

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SOURCE CATEGORY: Manufacturing Nutritional Yeast (formerly Bakers Yeast)  
MACT CODE: 1101

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FEDERAL REGISTER CITATION: 64FR27876  
40 CFR 63 SUBPART: CCCC

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 05/21/04

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	10	0

COMMENTS: Processes used in nutritional yeast manufacturing, including fermenters, are a source of acetaldehyde. The final rule establishes emission limits for VOC as a surrogate for acetaldehyde, which makes up a portion of the total VOC emitted. The preamble to the final rule estimates that national baseline VOC emissions of 900 tons per year can be reduced by 93 tons per year via this emission standard. This is equal to a 10 percent VOC emission reduction. Compliance with this emission standard is expected to occur by process control.

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REFERENCES:

64 FR 27876, 2001: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Manufacturing of Nutritional Yeast; Final Rule," Vol. 64, pg. 27876, 2001. Retrieved March 17, 2005 from: <http://www.epa.gov/ttn/atw/yeast/fr21my01.pdf>

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**Table A-14. Metal Can Surface Coating**

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SOURCE CATEGORY: Metal Can Surface Coating  
MACT CODE: 0707

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FEDERAL REGISTER CITATION: 68FR64431  
40 CFR 63 SUBPART: KKKK

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 11/13/06

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	70	+

COMMENTS: Metal can surface coating operations include processes that coat metal cans or ends or metal crowns or closures during any stage of the can manufacturing process. The coating operations affected by this rule include the following four subcategories: one- and two- piece draw iron can body coating; sheet coating; three-piece can assembly; and, end coating. The final rule establishes emission limits for ethylene glycol monobutyl ether and other glycol ethers, xylenes, hexane, methyl isobutyl ketone, and methyl ethyl ketone. The preamble to the final rule estimates that baseline organic HAP emissions of 9,600 tons per year can be reduced by approximately 6,800 tons per year nationwide via this emission standard. This is equal to a 70 percent HAP emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction. Compliance with this emission standard is expected to occur by installing a regenerative thermal oxidizer, particularly for facilities in the draw and iron can body coating and sheetcoating subcategories. Add-on controls contribute to on-site NO<sub>x</sub> emission increases (+).

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ADDITIONAL INFORMATION: See <http://www.epa.gov/ttn/atw/mcan/mcanfacilities.pdf> for a list of sources that can be used as a screening tool for identifying potentially affected sources in each State.

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REFERENCES:

68 FR 64431, 2003: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Cans; Final Rule," Vol. 68, pg. 64431, 2003.  
Retrieved March 17, 2005 from: <http://www.epa.gov/ttn/atw/mcan/fr13no03.pdf>

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**Table A-15. Metal Coil Surface Coating**

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SOURCE CATEGORY: Metal Coil Surface Coating  
MACT CODE: 0708

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FEDERAL REGISTER CITATION: 67FR39793  
40 CFR 63 SUBPART: SSSS

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 06/10/05

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	53	+

COMMENTS: The final rule identifies metal coil surface coating as a major source of HAP emissions such as methyl ethyl ketone, glycol ethers, xylenes (isomers and mixtures), toluene, and isophorone. These air toxics are emitted mostly during the coating application and curing operations. The final rule estimates that national baseline organic emissions of 2,484 tons per year will be reduced by 1,318 tons per year nationwide via this emission standard. The VOC emission reduction should be similar. This is equal to a 53 percent VOC emission reduction. Compliance with this emission standard is expected to occur by installing thermal oxidizers and catalytic oxidizers, which contribute to on-site NO<sub>x</sub> emission increases (+).

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ADDITIONAL INFORMATION: See <http://www.epa.gov/ttn/atw/mcoil/mcoilfacilities.pdf> for an initial list of sources that may be used as a screening tool for identifying potentially affected sources in each State.

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REFERENCES:

67 FR 39793, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Surface Coating of Metal Coil, Final Rule," Vol. 67, pg. 39793, 2002.  
Retrieved March 22, 2005 from: <http://www.epa.gov/ttn/atw/mcoil/fr10jn02.pdf>

Barnett, 2005: Keith Barnett, SPSD, OAQPS, U.S. EPA, personal communication of Project Tracking System data with J. Silvasi and D. Gerth, AQSSD, OAQPS, U.S. EPA, and K. Thesing, E.H. Pechan & Associates, Inc., March 22, 2005.

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## Table A-16. Miscellaneous Coating Manufacturing

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SOURCE CATEGORY: Miscellaneous Coating Manufacturing  
MACT CODE: 1642

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FEDERAL REGISTER CITATION: 68 FR 69163  
40 CFR 63 SUBPART: HHHHH

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 12/11/06

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	64	+

COMMENTS: The final rule requires facilities to install emissions controls for process vessels, storage tanks, equipment leaks, wastewater systems, and transfer operations at facilities covered by this rule. The HAP emitted from miscellaneous coating manufacturing facilities include toluene, xylene, glycol ethers, methyl ethyl ketone, and methyl iso-butyl ketone. The preamble to the final rule estimates that baseline organic HAP emissions of 7,600 tons per year can be reduced by 4,900 tons per year nationwide via this emission standard. This is equal to a 64 percent HAP emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction. Compliance with this rule is expected to occur by installing add-on controls. Add-on controls such as thermal or catalytic oxidizers contribute to on-site NO<sub>x</sub> emission increases (+).

---

REFERENCES:

68 FR 69163, 2003: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Coating Manufacturing; Final Rule," Vol. 68, pg. 69163, 2003. Retrieved March 17, 2005 from: <http://www.epa.gov/ttn/atw/mcm/fr11de03.pdf>

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**Table A-17. Miscellaneous Organic Chemical Production and Processes (MON)**

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SOURCE CATEGORY: Miscellaneous Organic Chemical Production and Processes (MON)  
MACT CODE: 1641

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FEDERAL REGISTER CITATION: 68FR63851  
40 CFR 63 SUBPART: FFFF

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 11/10/06

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	69	+

COMMENTS: The final rule requires facilities to install emissions controls for process vents, storage tanks, equipment leaks, wastewater systems, and transfer operations at facilities covered by this rule. The final rule establishes emission limits for organic and inorganic HAPs, hydrogen chloride, and some particulate HAPs. The preamble to the final rule estimates that HAP emissions of 24,200 tons per year can be reduced by 16,800 tons per year nationwide via this emission standard. This is equal to a 69 percent HAP emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction. Compliance with this rule is expected to occur by installing add-on controls. Though not quantified by EPA, add-on controls such as thermal or catalytic oxidizers contribute to on-site NO<sub>x</sub> emission increases (+).

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REFERENCES:

68 FR 63851, 2003: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing; Final Rule," Vol. 68, pg. 63851, 2003. Retrieved March 17, 2005 from:  
<http://www.epa.gov/ttn/atw/mon/fr10no03.pdf>

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**Table A-18. Municipal Solid Waste Landfills**

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SOURCE CATEGORY: Municipal Solid Waste Landfills  
MACT CODE: 0802

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FEDERAL REGISTER CITATION: 68 FR 2227  
40 CFR 63 SUBPART: AAAA

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SOURCE APPLICABILITY: Major and Area

Compliance Date: 01/16/04

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	75	0

COMMENTS: The final rule contains emissions limitations for HAPs including toluene, benzene, xylenes, vinyl chloride, and ethyl benzene. This standard applies to all municipal solid waste landfills also subject to the new source performance standards/emission guidelines promulgated in March 1996. In 1996, emissions from affected landfills were estimated to be 37,408 tons per year. The new source performance standards/emission guidelines requirements are expected to reduce HAP emissions by 28,139 tons per year. This is equal to a 75 percent HAP emission reduction nationwide. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction. This reduction will be achieved by use of landfill gas collection and control systems. Examples of controls are flares, enclosed flares, boilers, turbines, and incinerators and these add-on controls contribute to on-site NO<sub>x</sub> emission increases (+).

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REFERENCES:

68 FR 2227, 2003: *Federal Register*, "National Emission Standards for Hazardous Air: Municipal Solid Waste Landfills; Final Rule," Vol. 68, pg. 2227, 2003. Retrieved March 24, 2005 from <http://www.epa.gov/ttn/atw/landfill/fr16ja03.pdf>

Meyer, Kate, 1999: Documentation of Emissions Estimates; memorandum from K. Meyer, ERG to Michele Laur, U.S. EPA on December 13, 1999; OAR-2002-0047-0030

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**Table A-19. Organic Liquids Distribution**

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SOURCE CATEGORY: Organic Liquids Distribution (Non-Gasoline)

MACT CODE: 0602

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FEDERAL REGISTER CITATION: 69FR5038

40 CFR 63 SUBPART: EEEE

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 02/03/07

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	70	+

COMMENTS: The final rule requires emissions controls and/or requirements for work practices for three groups of emission points: storage tanks, transfer racks, and equipment leaks. The final rule will reduce emissions for many HAPs, including benzene, ethylbenzene, toluene, vinyl chloride and xylenes. The preamble to the final rule estimates that national baseline VOC emissions of 14,100 tons per year will be reduced by 9,900 tons per year nationwide via this emission standard. This is equal to a 70 percent VOC emission reduction. Controls could include combustion controls, but other devices, such as floating roof tanks and vapor balancing systems are allowed. In cases where combustion controls are used for compliance they could contribute to slight on-site NO<sub>x</sub> emission increases (+).

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REFERENCES:

69 FR 5038, 2004: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)," Vol. 69, pg. 5038, 2004. Retrieved March 22, 2005 from: <http://www.epa.gov/ttn/atw/orgliq/fr03fe04.pdf>

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**Table A-20. Paper and Other Web Surface Coating**

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SOURCE CATEGORY: Paper and Other Web Surface Coating  
MACT CODE: 0711

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FEDERAL REGISTER CITATION: 67FR72329  
40 CFR 63 SUBPART: JJJJ

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 12/04/05

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	80	+

COMMENTS: The emission limits in the final rule apply to coating lines where coating is applied to web substrates and subsequently dried. The organic HAP emitted from the paper and other web coating processes include toluene, methanol, methyl ethyl ketone, xylenes, and phenol, among others. The preamble to the final rule estimates that national baseline organic HAP emissions of 39,000 tons per year can be reduced by 32,000 tons per year. This is equal to an 82 percent HAP emission reduction. However, the actual average reductions maybe less because the rule has the option to substitute non-HAP VOC for HAP VOC. The final rule estimates that more than 99 percent of the organic HAP emissions from paper and other web coating are VOC. As such, the expected VOC reduction is assumed equivalent to the listed HAP reduction. The add-on controls expected to be used are thermal and catalytic oxidizers and carbon oxidizers. In cases where oxidizers are used for compliance, this will contribute to slight on-site NO<sub>x</sub> emission increases (+).

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ADDITIONAL INFORMATION: The TTN air toxics web site at <http://www.epa.gov/ttn/atw/powc/powcpg.html> states that a list of affected sources is not available. It is recommended that interested parties use the Toxics Release Inventory (TRI) reporting data to compile any potentially affected source lists.

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REFERENCES:

67 FR 72329, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Paper and Other Web Coatings; Final Rule," Vol. 67, pg. 72329, 2002. Retrieved March 17, 2005 from: <http://www.epa.gov/ttn/atw/powc/fr04de02f.pdf>

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**Table A-21. Pesticide Active Ingredient Production**

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SOURCE CATEGORY: Pesticide Active Ingredient Production  
MACT CODE: 0911

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FEDERAL REGISTER CITATION: 64FR33549  
40 CFR 63 SUBPART: MMM

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 12/23/03

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	65	+

COMMENTS: Affected operations associated with the manufacture of pesticide active ingredients include process vents, storage vessels, wastewater and associated treatment residuals, equipment components, and heat exchange systems. Pesticide active ingredient production results in emissions of toluene, methanol, methyl chloride, and hydrogen chloride. The preamble to the final rule estimates that national baseline total HAP emissions of 4,240 tons per year will be reduced by 2,755 tons per year nationwide via this emission standard. This is equal to a 65 percent total HAP emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction. Compliance with this emission standard is expected to occur by installing combustion controls and condensers. There also is the option for HAP reduction by substitution through the pollution prevention alternative. In cases where combustion controls, are used for compliance, this could contribute to slight on-site NO<sub>x</sub> emission increases (+).

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ADDITIONAL INFORMATION: See <http://www.epa.gov/ttn/atw/pest/pestsour.wpd> for a list of sources that can be used as an initial screening tool for identifying affected sources in each State.

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REFERENCES:

64 FR 33549, 1999: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Pesticide Active Ingredient Production; Final Rule," Vol. 64, pg. 33549, 1999. Retrieved March 17, 2005 from: <http://www.epa.gov/ttn/atw/pest/fr62399.pdf>

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## Table A-22. Petroleum Refineries

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SOURCE CATEGORY: Petroleum Refineries  
MACT CODE: 0502

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FEDERAL REGISTER CITATION: 67FR17761  
40 CFR 63 SUBPART: UUU

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 04/11/05

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	57	+

COMMENTS: The final rule contains emission limitations for HAP emissions of particulate metals and organic compounds from catalytic cracking units, organic and inorganic compounds from catalytic reforming units, and reduced sulfur compounds from sulfur recovery units. A memorandum (see reference below) provides emission impacts for VOC. According to that memorandum, a baseline emission estimate of 1650 tons VOC is expected to be controlled to 710 tons VOC. This is a 57 percent reduction. Compliance with this emission standard is expected to occur by installing add-on controls, which contribute to slight on-site NO<sub>x</sub> emission increases (+).

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REFERENCES:

**Coburn, Jeff, 2001: Impact Estimates for the Final Petroleum Refinery MACT 2 Rule; memorandum from J. Coburn, RTI to Bob Lucas, U.S. EPA on January 12, 2001**

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**Table A-23. Plywood and Composite Wood Products**

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SOURCE CATEGORY: Plywood and Composite Wood Products  
MACT CODE: 1624

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FEDERAL REGISTER CITATION: 69 FR 45943  
40 CFR 63 SUBPART: DDDD

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 10/01/07\*

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	54	+

COMMENTS: The final rule will reduce HAPs including methanol, formaldehyde, acrolein, acetaldehyde, phenol and propionaldehyde for facilities that manufacture plywood and veneer; particleboard; medium density fiberboard; hardboard; fiberboard; oriented strandboard; and engineered wood products. The preamble to the final rule estimates that the VOC emissions of 50,000 tons per year can be reduced by up to 27,000 tons per year nationwide via this emission standard. This is equal to a 54 percent VOC emission reduction. Compliance with this emission standard is expected to occur by installing regenerative thermal oxidizers, which contribute to on-site NO<sub>x</sub> emission increases (+).

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ADDITIONAL INFORMATION: See <http://www.epa.gov/ttn/atw/plypart/plants.pdf> for an initial list of sources that may be used as a screening tool for identifying potentially affected sources in each State.

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REFERENCES:

69 FR 45943, 2004: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products; Effluent Limitations Guidelines and Standards for the Timber Products Point Source Category; List of Hazardous Air Pollutants, Lesser Quantity Designations Source Category List; Final Rule," Vol. 69, pg. 45943, 2004. Retrieved on March 17, 2005 from <http://www.epa.gov/ttn/atw/plypart/fr30jy04.pdf>.

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\*The 2007 compliance date is applicable for existing sources only. Compliance date for new sources between 01/09/03 and 09/28/04 is 09/28/04. For new sources started up after 09/24/04, compliance date is upon startup. See <http://www.epa.gov/ttn/atw/plypart/pcwptimeline9-30.pdf>

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**Table A-24. Polymers and Resins III**

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SOURCE CATEGORY: Polymers and Resins III

MACT CODE: 1347

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FEDERAL REGISTER CITATION: 65 FR 3275

40 CFR 63 SUBPART: OOO

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 01/20/03

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	51	0

COMMENTS: The final rule will reduce emissions of HAPs including formaldehyde, phenol, methanol, xylene, and toluene affecting new and existing amino/phenolic resin manufacturing facilities and such operations as batch and continuous process vents; storage tanks; equipment leaks; and heat exchange systems. The preamble to the final rule estimates that the organic HAPs emissions of 703 tons per year can be reduced by 361 tons per year nationwide via this emission standard. This is equal to a 51 percent organic HAPs emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction.

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REFERENCES:

65 FR 3275, 2000: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants for Amino/Phenolic Resins Production;; Final Rule," Vol. 65, pg. 3275, 2000. Retrieved March 17, 2005 from <http://www.epa.gov/ttn/atw/amino/fr20ja00.pdf>

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**Table A-25. Refractory Products Manufacturing**

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SOURCE CATEGORY: Refractory Products Manufacturing

MACT CODE: 0406

FEDERAL REGISTER CITATION: 68FR18729

40 CFR 63 SUBPART: SSSSS

SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 04/17/06

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	81	+

COMMENTS: The final rule will reduce emissions of organic air toxics such as formaldehyde, polycyclic organic matter, phenol, ethylene glycol, and methanol that occur during the manufacture of refractory products. The rule also limits emissions of hydrogen fluoride and hydrochloric acid from new kilns during the manufacture of clay refractory products. Processes within refractory facilities that emit organic air toxics include drying, curing, firing, pitch and brick preheating, defuming of pitch impregnated shapes, and coking. The preamble to the final rule estimates that VOC emissions will be reduced by 182 tons per year nationwide via this emission standard. This is equal to an 81 percent VOC emission reduction. Compliance with this emission standard is expected to occur by installing add-on controls. Though not quantified by EPA, add-on controls such as thermal or catalytic oxidizers contribute to on-site NO<sub>x</sub> emission increases (+).

## REFERENCES:

68 FR 18729, 2003: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants for Refractory Products Manufacturing; Final Rule," Vol. 68, pg. 18729, 2003. Retrieved March 23, 2005 from: <http://www.epa.gov/ttn/atw/refrac/fr16ap03.pdf>

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**Table A-26. Reinforced Plastic Composites Production**

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SOURCE CATEGORY: Reinforced Plastic Composites Production

MACT CODE: 1337

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FEDERAL REGISTER CITATION: 68 FR 19375

40 CFR 63 SUBPART: WWWW

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 04/21/06

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	39	+

COMMENTS: The final rule will reduce emissions of HAPs such as styrene, methyl methacrylate, and methylene chloride for facilities that manufacture products with thermoset resins and gel coats, including fiberglass bath tubs and showers, automobile and recreational vehicle parts, storage tanks, and engine and tool covers. The preamble to the final rule estimates that the national HAP emissions of 18,000 tons per year can be reduced by 7,682 tons per year via this emission standard. Methylene chloride comprises 1,100 tons of the total HAP, 100 percent of which is controlled via this standard. The remaining HAP emissions are VOCs. The baseline VOC emissions are 16,900 tons per year. This rule estimates these emissions will be reduced nationally to 6,582 tons per year. This is equal to a 39 percent VOC emission reduction. A minimal increase in NO<sub>x</sub> emissions is expected with the implementation of this standard.

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ADDITIONAL INFORMATION: See the following document for a potential list of the affected sources: <http://www.epa.gov/ttn/atw/rpc/listofsources.pdf>

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REFERENCES:

68 FR 19375, 2001: *Federal Register*, "National Emission Standards for Boat Manufacturing; Final Rule," Vol. 66, pg. 44217, 2001. Retrieved March 22, 2005 from <http://www.epa.gov/ttn/atw/rpc/fr21ap03.pdf>

Barnett, 2005: Keith Barnett, SPSD, OAQPS, U.S. EPA, personal communication of Project Tracking System data with J. Silvasi and D. Gerth, AQSSD, OAQPS, U.S. EPA, and K. Thesing, E.H. Pechan & Associates, Inc., March 22, 2005.

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**Table A-27. Rubber Tire Manufacturing**

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SOURCE CATEGORY: Rubber Tire Manufacturing  
MACT CODE: 1631

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FEDERAL REGISTER CITATION: 67 FR 45598  
40 CFR 63 SUBPART: XXXX

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 07/11/05

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	52	0

COMMENTS: The final rule contains emission standards to reduce HAP emissions including hexane, toluene, formaldehyde, styrene and methanol for all new or existing major source rubber tire manufacturing facilities including tire production, tire cord production, and puncture sealant application operations. Reductions from this standard result primarily from controls on the tire production subcategory, and to a lesser extent, tire cord production facilities. No additional controls were required for the one identified puncture sealant application operation. For the tire production subcategory the final rule estimates a reduction of total HAPs by 1,047 tons per year and for tire cord production, the estimated HAP reduction is 37 tons per year. The preamble to the final rule estimates that the total HAP emissions can be reduced by 1,084 tons per year nationwide, or 52 percent via this emission standard and that VOCs will be reduced by the same amount as HAPs.

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ADDITIONAL INFORMATION: Appendix 1 of EPA's document titled "Rubber Tire Manufacturing NESHAP; Summary of Regulatory Requirements," located at [http://www.epa.gov/ttn/atw/tire/rubber\\_tire\\_macttools.pdf](http://www.epa.gov/ttn/atw/tire/rubber_tire_macttools.pdf) contains a list of affected facilities from the 1999 NTI Database.

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REFERENCES:

67 FR 45598, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Rubber Tire Manufacturing; Final Rule," Vol. 67, pg. 45598, 2002. Retrieved March 17, 2005 from <http://www.epa.gov/ttn/atw/tire/fr09jy02r.pdf>

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**Table A-28. Site Remediation**

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SOURCE CATEGORY: Site Remediation

MACT CODE: 0805

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FEDERAL REGISTER CITATION: 68 FR 58171

40 CFR 63 SUBPART: GGGGG

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 10/08/06

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	50	0

COMMENTS: The final rule requires emission controls and/or work practices to limit emissions of benzene, ethylbenzene, toluene, vinyl chloride, xylenes, and other VOCs from process vents; units used to manage remediation materials; and equipment leaks. The preamble to the final rule estimates that the national baseline VOC emissions of 8,113 tons per year can be reduced by 4,056 tons per year. This is equal to a 50 percent VOC emission reduction.

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REFERENCES:

68 FR 58171, 2003: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Site Remediation; Final Rule," Vol. 68, pg. 58171, 2003. Retrieved March 16, 2005 from <http://www.epa.gov/ttn/atw/siterm/fr08oc03.pdf>

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### Table A-29. Solvent Extraction for Vegetable Oil Production

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SOURCE CATEGORY: Solvent Extraction for Vegetable Oil Production  
MACT CODE: 1103

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FEDERAL REGISTER CITATION: 66 FR 19006  
40 CFR 63 SUBPART: GGGG

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 04/12/04

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	25	0

COMMENTS: This rule establishes standards for facilities that use hexane to extract oil from vegetable seeds. Facilities are expected to comply with this rule by upgrading equipment to recover and recycle solvents. The preamble to the final rule estimates that the VOC emissions can be reduced by 10,600 tons per year nationwide via this emission standard. Relative to the baseline, this is equal to a 25 percent VOC emission reduction. No increases in NO<sub>x</sub> emissions are expected from this standard.

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REFERENCES:

66 FR 19006, 2001: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Solvent Extraction for Vegetable Oil Production; Final Rule," Vol. 66, pg. 19006, 2001. Retrieved March 16, 2005 from <http://www.epa.gov/ttn/atw/vegoil/fr12ap01.pdf>

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### Table A-30. Wet Formed Fiberglass Mat Production

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SOURCE CATEGORY: Wet Formed Fiberglass Mat Production  
MACT CODE: 0413

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FEDERAL REGISTER CITATION: 67 FR 17823  
40 CFR 63 SUBPART: HHHH

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 04/11/05

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POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	74	+

COMMENTS: The final rule establishes emissions limits for formaldehyde as a surrogate for total HAP emissions, which also include methanol and vinyl acetate. The preamble to the final rule estimates that national baseline HAP emissions of 295 tons per year can be reduced by 219 tons per year via this emission standard. This is equal to a 74 percent HAP emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction. Compliance with this emission standard is likely to occur by installing regenerative thermal oxidizers to capture and incinerate HAPs. Add-on controls contribute to on-site NO<sub>x</sub> emission increases (+).

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REFERENCES:

67 FR 17823, 2002: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants for Wet-Formed Fiberglass Mat Production; Final Rule," Vol. 67, pg. 17823, 2002. Retrieved March 16, 2005 from <http://www.epa.gov/ttn/atw/wetfiber/fr11ap02.pdf>

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**Table A-31. Wood Building Products**

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SOURCE CATEGORY: Wood Building Products (surface coating)(formerly Flat Wood Paneling Products)  
MACT CODE: 0703

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FEDERAL REGISTER CITATION: 68 FR 31746  
40 CFR 63 SUBPART: QQQQ

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SOURCE APPLICABILITY: Major

COMPLIANCE DATE: 05/28/06

POLLUTANT(S)	VOC	NO <sub>x</sub>
NATIONAL % REDUCTION	63	0

COMMENTS: The final rule establishes standards to reduce organic HAPs including xylene, toluene, glycol ethers, ethyl benzene, methyl ethyl ketone, methyl isobutyl ketone, methanol, styrene, and formaldehyde for all major sources that apply a surface coating to wood building products. The preamble to the final rule estimates that baseline organic HAP emissions of 7,800 tons per year can be reduced by 4,900 tons per year nationwide via this emission standard. This is equal to a 63 percent organic HAP emission reduction. Since the majority of the HAPs regulated are also VOCs, the expected VOC reduction is assumed equivalent to the listed HAP reduction.

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ADDITIONAL INFORMATION: See [http://www.epa.gov/ttn/atw/wbldg/wbp\\_appstmt.pdf](http://www.epa.gov/ttn/atw/wbldg/wbp_appstmt.pdf) for an applicability statement that may be used as an initial screening tool for identifying potentially affected sources in each State.

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REFERENCES:

68 FR 31746, 2003: *Federal Register*, "National Emission Standards for Hazardous Air Pollutants: Surface Coating of Wood Building Products; Final Rule," Vol. 68, pg. 31746, 2003. Retrieved March 16, 2005 from <http://www.epa.gov/ttn/atw/wbldg/fr28my03r.pdf>





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