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**Massachusetts
Reasonably Available Control Technology
State Implementation Plan Revision
For the
2008 and 2015 Ozone
National Ambient Air Quality Standards**

October 18, 2018

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Attachment 2	Background Document on Proposed Amendments to 310 CMR 7.00 Air Pollution Control, August 12, 2016
Attachment 3	Response to Comments on Proposed Amendments to 310 CMR 7.00 Air Pollution Control, March 9, 2018
Attachment 4	Background Document on Proposed Amendments to Municipal Waste Combustor Regulations, May 2013
Attachment 5	Response to Comments on Proposed Amendments to Municipal Waste Combustor Regulations, March 9, 2018

1. Summary

The Massachusetts Department of Environmental Protection (MassDEP) has prepared this revision to the Massachusetts State Implementation Plan (SIP) to address Reasonably Available Control Technology (RACT) requirements for the 2008 and 2015 8-hour ozone National Ambient Air Quality Standards (NAAQS). For certain source categories, MassDEP is submitting regulations that establish new or more stringent RACT controls. For other source categories, MassDEP is certifying that previously adopted RACT regulations and controls represent RACT for implementing the 2008 and 2015 ozone NAAQS.

Table 1 shows source categories for which MassDEP has adopted more stringent RACT regulations for volatile organic compounds (VOC) and nitrogen oxides (NO_x). MassDEP is submitting these regulations to the U.S. Environmental Protection Agency (EPA) for approval into the Massachusetts SIP (see Attachments 1 – 5). Appendix 1 and Appendix 2 list additional source categories for which MassDEP is certifying that previously adopted controls continue to represent RACT. Appendix 3 lists facilities that are major sources of VOC and NO_x emissions that have approved source-specific RACT controls that MassDEP is certifying continue to represent RACT.

Table 1
Source Categories with New or More Stringent RACT Regulations

RACT SOURCE CATEGORY	POLLUTANT
Boilers, Stationary Combustion Turbines, and Stationary Reciprocating Internal Combustion Engines	NO _x
Municipal Waste Combustors	NO _x
Fiberglass Boat Manufacturing	VOC
Flat Wood Paneling Surface Coating	VOC
Flexible Packaging (Packaging Rotogravure and Packaging Flexographic) Printing	VOC
Industrial Cleaning Solvents	VOC
Large Appliance Surface Coating	VOC
Metal Furniture Surface Coating	VOC
Offset Lithographic Printing and Letterpress Printing	VOC
Paper, Film, and Foil Surface Coating	VOC
Surface Coating of Miscellaneous Metal Parts and Products	VOC
Surface Coating of Plastic Parts	VOC

2. Background

EPA defines RACT as the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and

economic feasibility.¹ Sections 172(c)(1) and 182(b)(2) of the Clean Air Act (CAA) (42 U.S.C. § 7502(c)(1) and § 7511a(b)(2)) require states to implement RACT for certain sources of VOC and NO_x located in areas classified as moderate (and higher) nonattainment for ozone, and Section 184(b)(1)(B) of the CAA requires RACT in all areas located in the Ozone Transport Region (OTR)² irrespective of attainment designation. Massachusetts is located within the OTR and therefore is required to implement RACT for major sources of VOC and NO_x and source categories of VOC for which Control Technique Guidelines (CTGs) have been issued by EPA. In Massachusetts, the major source applicability thresholds are potential emissions of 50 tons per year for both VOC and NO_x.

To assist states with implementing RACT, EPA issued CTGs for various source categories of VOC emissions.³ CTGs establish a “presumptive norm” for RACT for the VOC source categories addressed. Some CTGs cover only major sources of VOC emissions while others apply at thresholds below the major source level.

EPA developed its first CTGs in the 1970s, and subsequently issued new CTGs and updates for certain source categories.⁴ States subject to RACT are required to adopt RACT for all CTGs issued by EPA.

MassDEP adopted regulations at 310 CMR 7.18 *Volatile and Halogenated Organic Compounds* and 310 CMR 7.24 *Organic Material Storage and Distribution*, which established emission controls on VOC sources consistent with EPA’s pre-2000 CTGs. EPA approved these regulations as meeting RACT and incorporated them into the Massachusetts SIP.⁵ If there were no facilities within a CTG source category in the state, MassDEP submitted a “negative declaration” to EPA.

For major sources not in a CTG category, MassDEP determined RACT on a facility-by-facility basis, as provided for in 310 CMR 7.18(17), through source-specific RACT Emission Control Plans. EPA approved these source-specific RACT determinations as part of the Massachusetts SIP. Facilities subject to source-specific RACT are listed in Appendix 3.

To meet NO_x RACT requirements established by 1990 amendments to the CAA, MassDEP adopted 310 CMR 7.19 *Reasonably Available Control Technology (RACT) for Sources of Oxides of Nitrogen (NO_x)*, which established RACT for large, medium, and small boilers; stationary combustion turbines; stationary reciprocating internal combustion engines; municipal waste combustors; and glass melting furnaces. It included provisions for source-specific NO_x RACT determinations for major “miscellaneous” NO_x sources with a potential to emit 50 tons or more per year of NO_x. EPA approved the 310 CMR 7.19 regulations into the Massachusetts SIP.⁶

¹ (44 FR 53762, September 17, 1979)

² Section 184(a) of the CAA established the Northeast Ozone Transport Region (OTR) and the Ozone Transport Commission (OTC). The OTR is comprised of the District of Columbia, a portion of Northern Virginia, and the states of Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, Delaware, and Maryland.

³ The CAA does not require NO_x CTGs.

⁴ EPA also issued several VOC Alternative Control Technologies (ACTs) in the 1980s and 1990s.

⁵ See 40 CFR 52.1167 for a complete list of EPA-approved Massachusetts SIP revisions, including those related to RACT regulations and determinations.

⁶ See EPA Approved Regulations in the Massachusetts SIP at: <https://www.epa.gov/sips-ma/epa-approved-regulations-massachusetts-sip>

MassDEP's previous adoption of RACT regulations for VOC and NO_x and issuance of source-specific RACT determinations met its RACT obligations under the 1979 1-hour ozone standard and the 1997 8-hour ozone standard.

3. RACT Requirements Under 2008 and 2015 Ozone NAAQS

Under CAA section 109(d), EPA is required to periodically review and promulgate, as necessary, revisions to the NAAQS to continue to protect human health and the environment. On March 27, 2008, EPA lowered the 8-hour ozone standard to 0.075 ppm from 0.08 ppm (2008 ozone NAAQS).⁷ On July 17, 2012, EPA designated Massachusetts as unclassifiable/attainment for the 2008 ozone NAAQS except in Dukes County, which EPA designated as marginal nonattainment.⁸ Dukes County subsequently attained the 2008 ozone standard by the 2015 attainment deadline.⁹

On October 1, 2015, EPA lowered the 8-hour ozone standard to 0.070 ppm, effective December 28, 2015.¹⁰ On November 6, 2017, EPA designated all counties in Massachusetts as attainment/unclassifiable except for Berkshire, Hampden, and Worcester Counties.¹¹ On April 30, 2018, EPA designated Berkshire, Hampden, and Worcester Counties as attainment/unclassifiable.¹²

With the exception of the marginal area planning requirements for the 2008 ozone standard for Dukes County, Massachusetts does not have any other non-attainment SIP obligations under the 2008 and 2015 ozone NAAQS. However, since Massachusetts is located within the OTR, it must comply with RACT requirements under the 2008 and 2015 ozone NAAQS regardless of its designated attainment status.

4. RACT Evaluation

MassDEP must meet RACT requirements by either adopting new or more stringent regulations or controls that represent RACT control levels or by certifying that previously adopted RACT controls in its SIP approved by EPA continue to represent RACT. In addition, if no applicable sources for a RACT category exist in Massachusetts, MassDEP must make a negative declaration.

MassDEP evaluated its RACT regulations and for certain source categories adopted new or more stringent RACT controls on March 9, 2018, as listed in Table 1 above. For VOC, the more

⁷ *National Ambient Air Quality Standards for Ozone*, 40 CFR Parts 50 and 58, Federal Register Vol. 73, No. 60, Thursday, March 27, 2008

⁸ 40 CFR Part 81, Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards: Final Rule. 77 FR 30088 (<https://www.gpo.gov/fdsys/pkg/FR-2012-05-21/pdf/2012-11618.pdf#page=2>)

⁹ 40 CFR Parts 52 and 81 Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, and Reclassification of Several Areas for the 2008 Ozone National Ambient Air Quality Standards: Final Rule. 81 FR 26697, May 4, 2016 (<https://www.gpo.gov/fdsys/pkg/FR-2016-05-04/pdf/2016-09729.pdf#page=1>).

¹⁰ Federal Register Vol. 80, No. 206, Monday October 26, 2015

¹¹ 40 CFR Part 81, Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards (NAAQS): Final rule. 82 FR 54232, November 16, 2017 (<https://www.gpo.gov/fdsys/pkg/FR-2017-11-16/pdf/2017-24640.pdf>) (effective January 16, 2018).

¹² Additional Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards, EPA, Final rule. 83 FR 25776 June 4, 2018 (<https://www.govinfo.gov/content/pkg/FR-2018-06-04/pdf/2018-11838.pdf>)

stringent controls were based on new or updated CTGs published by EPA that MassDEP had not yet adopted. For NO_x, the more stringent controls were based on MassDEP review of other state RACT requirements. These more stringent VOC and NO_x controls are described below, and Attachments 1 – 5 contain the amended regulations (redline/strikeout), Background Documents and Response to Comments for the regulatory amendments, which provide further analysis and explanation. For other source categories MassDEP determined its existing regulations continue to represent RACT. MassDEP also evaluated its single-source RACT controls at applicable major sources and determined that these controls continue to represent RACT. MassDEP also identified source categories where no sources exist in Massachusetts for which negative declarations are being made.

Appendix 1 lists EPA CTGs, MassDEP VOC RACT regulations that were adopted to meet the presumptive level of RACT established in the CTGs, alternative strategies that achieve equivalent VOC control, negative declarations for CTG categories for which Massachusetts does not have any sources, and the date EPA approved the RACT submittal into the Massachusetts SIP.

Appendix 2 lists EPA's Alternative Control Technologies (ACTs), MassDEP NO_x RACT regulations for specific source categories, and the date EPA approved the RACT submittal into the Massachusetts SIP.

Appendix 3 lists all major sources that are subject to single-source VOC and NO_x RACT determinations,¹³ and the date EPA approved and incorporated the RACT determination into the Massachusetts SIP.

A. VOC

Source Categories with New CTGs

From 2006 through 2016, EPA issued new or revised CTGs for the following twelve categories:

- Flat Wood Paneling Coatings (2006)
- Industrial Cleaning Solvents (2006)
- Offset Lithographic Printing and Letterpress Printing (2006)
- Flexible Package Printing (2006)
- Paper, Film, and Foil Coatings (2007)
- Large Appliance Coatings (2007)
- Metal Furniture Coatings (2007)
- Miscellaneous Metal and Plastic Parts Coatings (2008)
- Fiberglass Boat Manufacturing Materials (2008)
- Miscellaneous Industrial Adhesives (2008)
- Automobile and Light-Duty Truck Assembly Coatings (2008)
- Oil and Natural Gas Industry (2016)

In August 2013, MassDEP adopted regulations for adhesives and sealants that meet the Miscellaneous Industrial Adhesives CTG.¹⁴ On March 9, 2018, MassDEP adopted regulations

¹³ These are major sources for which a CTG or ACT source category has not been defined.

for the remainder of the source categories listed above to meet the CTG RACT requirements, except for Automobile and Light-Duty Truck Assembly Coatings and Oil and Natural Gas Industry. The previous sole automotive assembly facility in Massachusetts, General Motors in Framingham, closed in 1989. Therefore, MassDEP is making a negative declaration with respect to the Automobile and Light-Duty Truck Assembly Coatings CTG and rescinding 310 CMR 7.18(7), *Automobile Surface Coating*.

Completely new regulations adopted include 310 CMR 7.18(31), *Industrial Cleaning Solvents*, and (32), *Fiberglass Boat Manufacturing*. Existing regulations that were amended include:¹⁵

- 310 CMR 7.18(3), *Metal Furniture Surface Coating*
- 310 CMR 7.18(5), *Large Appliance Surface Coating*
- 310 CMR 7.18(11), *Surface Coating of Miscellaneous Metal Parts and Products* and (21), *Surface Coating of Plastic Parts* to incorporate the 2008 Miscellaneous Metal and Plastic Parts Coatings CTG
- 310 CMR 7.18(12), *Packaging Rotogravure and Packaging Flexographic Printing* (formerly *Graphic Arts*) to incorporate the 2006 Flexible Package Printing CTG
- 310 CMR 7.18(14), *Paper, Film and Foil* (formerly *Paper*) *Surface Coating*
- 310 CMR 7.18(24), *Flat Wood Paneling Surface Coating*
- 310 CMR 7.18(25), *Offset Lithographic Printing and* [added] *Letterpress Printing*

The CTG for the Oil and Natural Gas Industry covers VOC emissions from pneumatic controllers, pneumatic pumps, compressors, equipment leaks, fugitive emissions, and storage vessels in the onshore production and processing segments of the oil and natural gas industry, as well as storage vessel VOC emissions from the natural gas transmission and storage segment. There are no oil or natural gas production or processing, or natural gas storage facilities in Massachusetts. Within the natural gas transmission segment, there are no condensate storage tanks. Therefore, MassDEP is making a negative declaration with respect to the Oil and Natural Gas Industry CTG.

MassDEP deleted the provisions of 310 CMR 7.18(12), formerly *Graphic Arts*, pertaining to publication rotogravure printing since there are no longer any such printing presses operating in Massachusetts. Therefore, MassDEP is making a negative declaration with respect to facilities subject to the Publication Rotogravure provisions of the 1978 Graphic Arts – Rotogravure and Flexography CTG.

Changes in Regulated CTG Source Categories

MassDEP previously submitted a Negative Declaration with respect to the Ship Building and Ship Repair Operations (Surface Coating) category. However, Boston Ship Repair, LLC is operating a major VOC- and HAP-emitting facility in this category. This facility's emissions of VOC and HAP are subject to the NESHAP for Shipbuilding and Ship Repair (Surface Coating), 40 CFR part 63 subpart II, with the associated applicable requirements and compliance terms in the facility's Title V Operating Permit. The CTG applies to major VOC emitting facilities; it

¹⁴ Promulgated at 310 CMR 7.18(30). MassDEP amended these regulations on March 9, 2018 to ensure consistency with MassDEP's VOC requirements for printing operations regulated under 310 CMR 7.03, 310 CMR 7.18, and 310 CMR 7.26 and with the EPA CTG for Miscellaneous Industrial Adhesives.

¹⁵ See redline of amendments at: 310 CMR 7.00: Air Pollution Control (<https://www.mass.gov/doc/310-cmr-700-et-al-air-pollution-control>)

states that the NESHAP serves as a Model VOC RACT Rule for the category. Therefore, MassDEP has determined that VOC emissions from the facility are subject to the equivalent of RACT. There are several other shipbuilding and ship repair facilities in Massachusetts, each subject to enforceable facility-wide emissions caps below the VOC and HAP major thresholds.

Non-CTG Facility-specific RACT Determinations

For eight major VOC-emitting facilities outside the CTG categories, MassDEP previously approved RACT Emission Control Plans (ECPs) that were subsequently approved by EPA as “single-source” SIP revisions. One of these facilities, Duro Textile Printers, closed permanently in 2017. The remaining seven continue to operate in the same manufacturing sector relative to their operations on the dates of the respective ECPs and SIP revisions. These facilities are listed in Appendix 3. Some of these facilities have experienced physical and operational changes, including new and reconfigured processes subject to Best Available Control Technology (BACT) under state minor New Source Review (NSR), as well as process reformulation that avoided BACT/NSR but has resulted in steadily decreasing emissions.

MassDEP reviewed the original ECPs, currently effective applicable emissions standards from minor NSR permits and new or amended regulations such as MACT, if any, and emissions reports and compliance histories of the facilities, and certifies that current requirements for these facilities represent RACT control levels. Additional details are contained in the Comments column in Appendix 3.

MassDEP is submitting the updated negative declarations (Appendix 1) and final regulations to EPA for approval into the Massachusetts SIP.

B. NO_x

Boilers, Stationary Combustion Turbines, and Stationary Reciprocating Internal Combustion Engines

On March 9, 2018, MassDEP promulgated more stringent NO_x RACT emission standards for large boilers, stationary combustion turbines, and stationary reciprocating internal combustion engines (310 CMR 7.19). MassDEP evaluated other states’ recent RACT regulations and analyzed emissions and operational profiles of combustion units at major source facilities in Massachusetts to determine RACT requirements for these categories. As part of its review, MassDEP concluded that it was not reasonable for large boilers, turbines, and engines that operate infrequently to meet the more stringent emission limits. Therefore, the amended regulations exempt large boilers and turbines with a three-year-average capacity factor less than ten percent (10%) from the new emissions standards. MassDEP’s regulations already allow owners of engines that operate less than 1,000 hours in any 12-month period to make a specific combustion control adjustment to reduce NO_x rather than meet numerical emissions limits; this provision remains in the new RACT regulations.

The Background Document (Attachment 2) and Response to Comments Document (Attachment 3) describe the purpose for proposing the amendments and the MassDEP’s rationale for concluding that the proposed and final amended emissions standards constitute RACT.

For units that are included in proposals for alternative RACT, the amended regulation adds low emission combustion and gas-reburn controls to the list of emission controls that must be

evaluated for technological and economic feasibility. MassDEP is submitting the final amended 310 CMR 7.19 regulations to EPA for approval into the Massachusetts SIP.

Municipal Waste Combustors

On March 9, 2018, MassDEP promulgated new NO_x RACT emissions limits for large and small municipal waste combustors (MWCs). The new NO_x emission limits for large MWCs appear in 310 CMR 7.08(2) instead of 310 CMR 7.19 so that all emission standards for large MWCs are in a single regulation.¹⁶ The new NO_x emissions limits for small MWCs appear in 310 CMR 7.19(9), with that section revised to apply to small MWCs only.

Under 310 CMR 7.08(2), the latest amendments reduce the NO_x emissions standards for mass-burn waterwall and refuse-derived-fuel (Rdf) stoker units from the 40 CFR part 60 emission guideline-derived standards of 205 and 250 parts per million (ppm), to updated RACT emissions concentration limits of 150 and 146 ppm, respectively. The level of the revised emissions standards was based on extensive continuous monitoring data that reflect actual emissions performance achieved by the five large MWC facilities in Massachusetts. These facilities use a combination of selective non-catalytic reduction (SNCR) as well as combustion air staging to minimize NO_x emissions and ammonia slip. The new emissions limits are consistent with the most stringent RACT regulations in nearby states.

For small MWC units under 310 CMR 7.19(9), MassDEP adopted a new 167 ppm emissions standard, which is a reasonable ceiling on NO_x emissions taking into account the inherent NO_x emissions performance and control technology limitations of refractory-wall modular mass-burn small MWC units.

The Background Document (Attachment 4) and Response to Comments Document (Attachment 5) describe the purpose for proposing the MWC amendments and the MassDEP's rationale for concluding that the proposed and final amended emissions standards constitute RACT. MassDEP is submitting the final amended regulations to EPA for approval into the Massachusetts SIP.

Facility-specific NO_x RACT SIP provisions

For three major NO_x-emitting facilities, MassDEP previously approved facility-specific RACT Emission Control Plans (ECPs), which were subsequently approved by EPA as "single-source" SIP revisions. One of these facilities, Solutia (formerly Monsanto), repowered its coal-fired boiler for natural gas-only firing. This modified unit is subject to the new more stringent RACT standard and compliance schedule in the 2018 regulation amendments. The remaining two facilities, Oldcastle (formerly Medusa) and Specialty Minerals, continue to operate the same emissions units and RACT controls in the previously approved ECPs and SIP revisions.

MassDEP reviewed the currently effective permits, applicable emissions standards, emissions reports and compliance histories of the facilities, and certifies that the controls on these facilities constitute RACT. Additional details are contained in the Comments column in Appendix 3.

¹⁶ 310 CMR 7.08(2) covers all requirements for air emissions for large MWCs, including the limits in EPA's Emission Guidelines.

5. Emission Reductions Achieved in Massachusetts

Emissions of VOC and NO_x from Massachusetts sources have declined substantially over the 15-year period during which RACT measures were implemented. Table 2 shows point source VOC emissions at three-year intervals from 1990 to 2014,¹⁷ and Table 3 shows the relative contribution of each source sector to total 2014 VOC emissions. From 1990 to 2014, Massachusetts point source VOC emissions declined 54 tons per summer day (TPSD) (84%), and VOC emissions declined 14,173 tons per year (TPY) (82%).¹⁸

Table 2

Massachusetts Point Source VOC Emission Trends 1990 to 2014		
Year	TPSD	TPY
1990	64	17,324
1993	61	19,165
1996	43	11,580
1999	28	9,831
2002	16	5,647
2005	17	6,038
2008	16	5,587
2011	11	4,119
2014	10	3,151

Table 3

Massachusetts 2014 VOC Emissions by Source Sector				
Sector	TPY	% of Total Inventory	TPSD	% of Total Inventory
Point	3,151	2%	9.8	3%
Area	76,038	58%	205.4	57%
On-Road Mobile	23,489	18%	58.0	16%
Off-Road Mobile	28,219	22%	85.7	24%
Total	130,897		358	

¹⁷ Data in Tables 2 – 5 is from the Massachusetts emissions inventory. Point source data is collected through MassDEP's Source Registration program (310 CMR 7.12).

¹⁸ MassDEP's emissions inventories report ozone precursor emissions for a typical summer day in addition to annual emissions because summer is when the highest ozone levels occur.

Table 4 shows point source NO_x emissions at three-year intervals over the same 15-year period, and Table 5 shows the relative contribution of each source sector to the total 2011 NO_x emissions. From 1990 to 2014, Massachusetts point source summer-day NO_x emissions declined 281 tons (TPSD) (88%), and annual emissions declined 102,266 tons (88%).

Table 4

Massachusetts Point Source NO_x Emission Trends 1990 to 2014		
Year	TPSD	TPY
1990	318	115,752
1993	298	92,876
1996	171	56,883
1999	180	60,272
2002	130	45,590
2005	105	36,865
2008	64	22,928
2011	43	15,686
2014	37	13,486

Table 5

Massachusetts 2014 NO_x Emissions by Source Sector				
Sector	TPY	% of Total Inventory	TPSD	% of Total Inventory
Point	13,486	11%	36.6	12%
Area	27,045	22%	34.5	11%
On-Road Mobile	39,519	32%	110.0	35%
Off-Road Mobile	44,444	36%	130.5	42%
Total	124,494		311.6	

Appendix 1

VOC RACT Certification for 2008 and 2015 Ozone NAAQS

EPA CTG for VOC	MassDEP RACT Regulations: Title and 310 CMR Section	Negative Declaration	EPA Approval Dates for MA RACT SIP	Meets RACT for 2008 and 2015 Ozone NAAQS?	Comments
Pre-1990 CTGs: Group 1					
1. Stage I Vapor Control Systems (1975)	Organic Material Storage and Distribution: 310 CMR 7.24(3). (See comments.)		43 FR 22356, 5/25/78 45 FR 61293, 9/16/80 54 FR 10148, 3/10/89 58 FR 34911, 6/30/93 64 FR 48304, 9/3/99	Yes	Gasoline distribution regulations were previously in 7.02(12). In 1990, all provisions were incorporated into 7.24. Regulation amendments in January 2015 meet RACT.
2. Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-duty Trucks (1977)	Volatile and Halogenated Organic Compounds: 7.18(4) – cans 7.18(10) – coils 7.18(14) – paper 7.18(15) – fabrics 7.18(16) – vinyl	For autos/light-duty trucks [310 CMR 7.18(7)]	45 FR 61293, 9/16/80 47 FR 9836, 3/8/82 48 FR 51480, 11/9/83	Yes, except there are no auto/light-duty truck coating sources in MA.	EPA updated the CTG for Paper, Film, and Foil Coatings in 2007; in 2018 MassDEP adopted regulations meeting the CTG. (see post-1990 CTGs below)
3. Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds (1977)		Yes	64 FR 48297, 9/3/99	There are no sources in MA.	
4. Solvent Metal Cleaning (1977)	Volatile and Halogenated Organic Compounds: 7.18(8) – Solvent Metal Degreasing		45 FR 61293, 9/16/80 48 FR 51480, 11/9/83 64 FR 48304, 9/3/99 58 FR 3495, 1/11/93 58 FR 34911, 6/10/93	Yes	MassDEP amended its regulations in 2009 based on an OTC Model Rule to incorporate a solvent vapor pressure limit of 1.0 mm Hg to meet RACT.
5. Tank Truck Gasoline Loading Terminals (1977)	Organic Material Storage and Distribution: 7.24(2), 7.24(4)		50 FR 38804, 9/25/85 54 FR 19184, 5/4/89 64 FR 48304, 9/3/99	Yes	
6. Surface Coating of Metal Furniture (1977)	Volatile and Halogenated Organic Compounds: 7.18(3)		45 FR 61293, 9/16/80	Yes	EPA updated the CTG in 2007; in 2018 MassDEP adopted meeting the CTG. (see post-1990 CTGs below)
7. Surface Coating of Insulation of Magnet Wire (1977)	Volatile and Halogenated Organic Compounds: 7.18(6)		45 FR 61293, 9/16/80	Yes	
8. Surface Coating of Large Appliances (1977)	Volatile and Halogenated Organic Compounds: 7.18(5)		45 FR 61293, 9/16/80	Yes	EPA updated this CTG in 2007; in 2018 MassDEP adopted regulations meeting the CTG. (see post-1990 CTGs below)

EPA CTG for VOC	MassDEP RACT Regulations: Title and 310 CMR Section	Negative Declaration	EPA Approval Dates for MA RACT SIP	Meets RACT for 2008 and 2015 Ozone NAAQS?	Comments
9. Bulk Gasoline Plants (1977)	Organic Material Storage and Distribution: 7.24(1)		45 FR 61923, 9/16/80 64 FR 48304, 9/3/99	Yes	
10. Storage of Petroleum Liquids in Fixed-Roof-Tanks (1977)	Organic Material Storage and Distribution: 7.24(1)		45 FR 61923, 9/16/80 49 FR 8611, 3/8/84 64 FR 48304, 9/3/99	Yes	
11. Use of Cutback Asphalt (1977)	Volatile and Halogenated Organic Compounds: 7.18(9)		45 FR 61293, 9/16/80 48 FR 51480, 11/9/83 58 FR 3495, 1/11/93 78 FR 54960, 9/9/13	Yes	
Pre-1990 CTGs: Group II					
12. Surface Coating of Miscellaneous Metal Parts and Products (1978)	Volatile and Halogenated Organic Compounds: 7.18(11)		47 FR 23927, 6/2/82 58 FR 3495, 1/11/93 58 FR 34911, 6/30/93	Yes	EPA published a new CTG for this sector under CTG for Miscellaneous Metal and Plastic Parts Coatings in 2008; in 2018, MassDEP adopted regulations that meet the CTG. (see post-1990 CTGs below)
13. Factory Surface Coating of Flat Wood Paneling (1978)	Volatile and Halogenated Organic Compounds: 7.18(24)		64 FR 48297, 9/3/99	Yes	EPA updated the CTG for Flat Wood Paneling in 2006; in 2018, MassDEP adopted regulations that meet the CTG. (see post-1990 CTGs below)
14. Leaks from Petroleum Refinery Equipment (1978)		Yes	64 FR 48297, 9/3/99	There are no sources in MA.	
15. Manufacture of Synthesized Pharmaceutical Products (1978)		Yes	64 FR 48297, 9/3/99	There are no sources in MA.	
16. Manufacture of Pneumatic Rubber Tires (1978)		Yes	64 FR 48297, 9/3/99	There are no sources in MA.	
17. Graphic Arts – Rotogravure & Flexography (1978)	Volatile and Halogenated Organic Compounds: 7.18(12)	For publication rotogravure printing	47 FR 23927, 6/2/82 64 FR 48304, 9/3/99	Yes	EPA updated the CTG for Flexible Package Printing in 2006; in 2018, MassDEP adopted regulations that meet the CTG. (see post-1990 CTGs below)
18. Petroleum Liquid Storage in External Floating Roof Tanks (1978)	Organic Material Storage and Distribution: 7.24(1)		49 FR 8611, 3/8/84 58 FR 34911, 6/30/93 64 FR 48304, 9/3/99	Yes	
19. Perchloroethylene Dry Cleaning Systems (1978)			47 FR 23927, 6/02/82 48 FR 51480, 11/09/83 52 FR 32792, 8/31/87	No certification is required.	CTG became moot when EPA delisted Perchloroethylene as a VOC.

10/18/18

EPA CTG for VOC	MassDEP RACT Regulations: Title and 310 CMR Section	Negative Declaration	EPA Approval Dates for MA RACT SIP	Meets RACT for 2008 and 2015 Ozone NAAQS?	Comments
20. Leaks from Gasoline Tank Trucks and Vapor Collection System (1978)	Organic Material Storage and Distribution: 7.24(4)		50 FR 38804, 9/25/85 64 FR 48304, 9/3/99	Yes	
Pre-1990 CTGs: Group III					
21. Large Petroleum Dry Cleaners (1982)		Yes	64 FR 48297, 9/3/99	There are no sources in MA.	
22. Manufacture of High-Density Polyethylene, Polypropylene and Polystyrene Resins (1983)		Yes	52 FR 32792, 8/31/87 64 FR 48297, 9/3/99	There are no sources in MA.	
23. Leaks from Natural Gas/Gasoline processing plants (1983)		Yes	52 FR 32792, 8/31/87	There are no sources in MA.	
24. Leaks from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment (1984)	Volatile and Halogenated Organic Compounds: 7.18(19)		52 FR 19175, 11/19/87	Yes	
25. Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry (1984)		Yes	52 FR 32792, 8/31/87 64 FR 48297, 9/3/99	There are no sources in MA.	

EPA CTG for VOC	MassDEP RACT Regulations: Title and 310 CMR Section	Negative Declaration	EPA Approval Dates for MA RACT SIP	Meets RACT for 2008 and 2015 Ozone NAAQS?	Comments
Post-1990 CTGs					
1. Reactor Processes and Distillation Operations in Synthetic Organic Chemical Manufacturing Industry (SOCMI) (1993)	One facility (Solutia) subject to CTG for distillation operations. Control system with a control efficiency of >85% (BACT in federally enforceable plan approval) determined to be equivalent to CTG RACT in 2002.	Yes, for reactor processes.	67 FR 62190, 10/4/02	Yes, for distillation operations. There are no reactor process sources in MA.	See Appendix 3 - list of facilities with single-source RACT certification.
2. Wood Furniture Manufacturing Operations (1996)	Volatile and Halogenated Organic Compounds: 7.18(23): Wood Products Surface Coating. EPA determined in 2002 that a combination of VOC regulations and BACT and RACT plan approvals for the 6 facilities covered by this CTG met RACT.		64 FR 48304, 9/3/99 67 FR 62190, 10/4/02	Yes	See Appendix 3 - list of facilities with single-source RACT certification.
3. Ship Building and Ship Repair Operations (Surface Coating) (1996)	The CTG explicitly cites the NESHAP for Shipbuilding and Ship Repair (Surface Coating), 40 CFR part 63 subpart II as a Model VOC RACT Rule for the category.		67 FR 62190, 10/4/02 (approved earlier Negative Declaration)	Boston Ship Repair is a major VOC and HAP emitting facility with Operating Permit that includes NESHAP 40 CFR part 63 subpart II.	Rescinding previous Negative Declaration since at least one major VOC-emitting facility operates in MA.
4. Aerospace (1997)	EPA determined that existing requirements met RACT (VOC regulations applied to the 2 facilities covered by the CTG)		67 FR 62190, 10/4/02	Yes	Aerospace coating and cleaning operations subject to, and complying with, SIP miscellaneous metal parts coating and solvent metal degreasing regulations.
5. Flat Wood Paneling Coating (2006)	Volatile and Halogenated Organic Compounds: 7.18(24) - Flat Wood Paneling Surface Coating		Pending EPA approval of this submittal	Yes	MassDEP amended its regulations in 2018 to meet this CTG.
6. Industrial Cleaning Solvents (2006)	Volatile and Halogenated Organic Compounds: 7.18(31) - Industrial Cleaning Solvents			Yes	MassDEP amended its regulations in 2018 to meet this CTG.

EPA CTG for VOC	MassDEP RACT Regulations: Title and 310 CMR Section	Negative Declaration	EPA Approval Dates for MA RACT SIP	Meets RACT for 2008 and 2015 Ozone NAAQS?	Comments
7. Offset Lithographic Printing and Letterpress Printing (2006)	Volatile and Halogenated Organic Compounds: 7.18(25) - Offset Lithographic Printing and Letterpress Printing 7.26(20-25, 27-29) - Environmental Results Program: Lithographic, Gravure, Letterpress, Flexographic and Screen Printing (except requirements for small and very small printers)		Pending EPA approval of this submittal	Yes	MassDEP amended its regulations in 2018 to meet this CTG. The requirements of 310 CMR 7.26(25) apply only to letterpress printing for compliance with the CTG.
8. Flexible Package Printing (2006)	Volatile and Halogenated Organic Compounds: 7.18(12) – Packaging Rotogravure and Packaging Flexographic Printing (formerly <i>Graphic Arts</i>)		Pending EPA approval of this submittal	Yes	MassDEP amended its regulations in 2018 to meet this CTG. MassDEP also deleted the provisions of 7.18(12) pertaining to publication rotogravure printing since there are no such sources in MA.
9. Paper, Film, and Foil Coatings (2007)	Volatile and Halogenated Organic Compounds: 7.18(14) Paper, Film, and Foil (formerly <i>Paper</i>) Surface Coating		Pending EPA approval of this submittal	Yes	MassDEP amended its regulations in 2018 to meet this CTG.
10. Large Appliance Coatings (2007)	Volatile and Halogenated Organic Compounds: 7.18(5)		Pending EPA approval of this submittal	Yes	MassDEP amended its regulations in 2018 to meet this CTG.
11. Metal Furniture Coatings (2007)	Volatile and Halogenated Organic Compounds: 7.18(3)		Pending EPA approval of this submittal	Yes	MassDEP amended its regulations in 2018 to meet this CTG.
12. Miscellaneous Metal and Plastic Parts Coatings (2008)	Volatile and Halogenated Organic Compounds: 7.18(11) - Surface Coating of Miscellaneous Metal Parts and Products, 7.18(21) - Surface Coating of Plastic Parts		Pending EPA approval of this submittal	Yes	MassDEP amended its regulations in 2018 to meet this CTG.
13. Fiberglass Boat Manufacturing Materials (2008)	Volatile and Halogenated Organic Compounds: 7.18(32)		Pending EPA approval of this submittal	Yes	MassDEP amended its regulations in 2018 to meet this CTG.
14. Miscellaneous Industrial Adhesives (2008)	Volatile and Halogenated Organic Compounds: 7.18(30)		80 FR 61101, 10/9/15	Yes	

EPA CTG for VOC	MassDEP RACT Regulations: Title and 310 CMR Section	Negative Declaration	EPA Approval Dates for MA RACT SIP	Meets RACT for 2008 and 2015 Ozone NAAQS?	Comments
15. Automobile and Light-Duty Truck Assembly Coatings (2008)		Yes		There are no sources in MA.	
16. Oil and Natural Gas Industry (2016)		Yes		There are no sources in MA.	
Other MassDEP VOC RACT Regulations					
	Volatile and Halogenated Organic Compounds: 7.18(22) - Leather Surface Coating 7.18(26) - Textile Finishing 7.18(27) - Coating Mixing Tanks		64 FR 48304, 9/3/99	Yes	In 1992, to address the lower VOC threshold of 50 tons, MassDEP grouped similar industrial processes and promulgated a CTG-like regulation for these processes, which were not covered by an EPA CTG.
	Volatile and Halogenated Organic Compounds: 7.24(6) - Dispensing of Motor Vehicle Fuel (Stage II regulations)		78 FR 10584, 2/14/13	Yes	

Appendix 2

NO_x RACT Certification for 2008 and 2015 Ozone NAAQS

NO _x RACT Source Categories (Based on EPA ACT Category Unless Otherwise Specified)	MassDEP RACT Regulations: Title and 310 CMR Section Number	EPA Approval Dates for MA RACT SIP	Meets RACT for 2008 and 2015 Ozone NAAQS?	Comments
NOTE: EPA's NO _x Alternative Control Technology (ACT) documents are listed below only to illustrate NO _x RACT source categories.				
All Sources, Individual Units (These "miscellaneous source categories" have no EPA ACT.)	RACT for Sources of Oxides of Nitrogen, Miscellaneous RACT: 7.19(12)		Yes Also, see Appendix 3.	RACT for Sources of Oxides of Nitrogen (7.19) applies to sources with a potential to emit ≥ 50 tons per year of NO _x , with certain exceptions. Applicability to an individual unit at a source is based on exceedances of a minimum capacity rating. Determination of RACT is facility-specific and single-source RACT revisions are submitted to EPA.
1. Nitric and Adipic Acid Manufacturing Plants (1991)			There are no sources in MA.	No sources.
2. Stationary Combustion Turbines (1993)	RACT for Sources of Oxides of Nitrogen, Stationary Combustion Turbines: 7.19(7)		Yes	MassDEP amended its regulations in 2018 to meet RACT.
3. Process Heaters (1993)	RACT for Sources of Oxides of Nitrogen: 7.19(12)		Yes	
4. Stationary Internal Combustion Engines (1993)	RACT for Sources of Oxides of Nitrogen, Stationary Reciprocating Internal Combustion Engines: 7.19(8)		Yes	MassDEP amended its regulations in 2018 to meet RACT.
5. Utility Boilers (1994)	RACT for Sources of Oxides of Nitrogen, Large Boilers: 7.19(4) <i>Additional Controls Not Classified As RACT:</i> <ul style="list-style-type: none"> ▪ NO_x Allowance Trading Program: 7.28 ▪ MA CAIR: 7.32 ▪ Emission Standards for Power Plant: 7.29 		Yes	MassDEP amended its regulations in 2018 to meet RACT.
6. Cement Manufacturing (1994, updated 2000)			There are no sources in MA.	
7. Industrial, Commercial, and Institutional (ICI) Boilers (1994)	RACT for Sources of Oxides of Nitrogen: 7.19(4) - Large Boilers; 7.19(5) - Medium-size Boilers; 7.19(6) - Small Boilers		Yes	MassDEP amended its regulations in 2018 to meet RACT.
8. Glass Manufacturing (1994)	RACT for Sources of Oxides of Nitrogen, Glass Melting Furnaces: 7.19(11)		There are no sources in MA.	Sole affected MA facility shut down in 2018

10/18/18

NO_x RACT Source Categories (Based on EPA ACT Category Unless Otherwise Specified)	MassDEP RACT Regulations: Title and 310 CMR Section Number	EPA Approval Dates for MA RACT SIP	Meets RACT for 2008 and 2025 Ozone NAAQS?	Comments
9. Iron and Steel Mills (1994)			There are no sources in MA.	
10. Municipal Waste Combustors (No ACT)	RACT for Sources of Oxides of Nitrogen, Municipal Waste Combustor Units: 7.19(9); Incinerators, Municipal Waste Combustors: 7.08(2)	64 FR 48098, 9/2/99	Yes	MassDEP amended its regulations in 2018 to meet RACT.

Appendix 3

Certification for 2008 and 2015 Ozone NAAQS for Facilities with Single-Source RACT Determinations

Facility	EPA Approval of Single-Source RACT	Major Source Pollutant NO _x > 50 TPY and/or VOC > 50 TPY	MassDEP Certification: Meets RACT for 2008 and 2015 Ozone NAAQS	Comments
Alliance Leather (Formerly Barnet Corporation)	10/4/02	VOC	Yes	MassDEP reviewed current applicable MACT requirements in the Operating Permit and determined controls meet RACT for leather coating VOC emissions
Brittany Dyeing and Finishing	3/6/95	VOC	Yes	Facility has reformulated and capped emissions from RACT affected processes and facility- wide
Callaway (Formerly Spalding Corporation)	11/8/89	VOC	Yes	Facility has reconfigured it's production processes subject to BACT and MACT, 40 CFR part 63 subpart PPPP
Duro Textile Printers	11/8/89	VOC	Yes	Facility closed in 2017
Erving Paper Mills	10/16/90	VOC	Yes	MassDEP determined current applicable requirements in the Operating Permit meet RACT for solvent removal of adhesive compounds from re- pulped post-consumer paper
Gillette	10/4/02	VOC	Yes	Product lines VOC content and actual emissions from facility steadily declining. RACT is no additional emissions control
Old Castle Stone (Formerly Medusa Minerals)	4/16/99	NO _x	Yes	MassDEP reviewed current operations and determined no additional NO _x emissions reductions are reasonably available
Solutia (Formerly Monsanto)	9/2/99	NO _x	Yes (see comments)	Facility repowered formerly coal-fired boiler with natural gas-only firing that are subject to new RACT emissions standards under 310 CMR 7.19(4)

Facility	EPA Approval of Single-Source RACT	Major Source Pollutant NO _x > 50 TPY and/or VOC > 50 TPY	MassDEP Certification: Meets RACT for 2008 and 2015 Ozone NAAQS	Comments
Solutia (Formerly Monsanto Chemical)	2/21/90 10/4/02	VOC	Yes	Plant-wide Leak Detection and Repair program covers RACT-affected equipment along with NSPS and MACT-affected equipment
Specialty Minerals	9/2/99	NO _x	Yes	MassDEP reviewed current operations and determined no additional NO _x emissions reductions reasonably available
St. Gobain Abrasives, Inc. (Formerly Norton)	10/4/02	VOC	Yes	MassDEP reviewed current operations and determined no additional VOC emissions reductions reasonably available.