



MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Maryland's 8-hour Ozone Reasonably Available Control Technology (RACT) State Implementation Plan

Proposed

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Table of Contents

1. Introduction.....	4
1.1. Background and Requirements	4
1.2. Responsibilities	8
2. Certification of VOC and NOx RACT Requirements	9
2.1. Certification of VOC RACT Requirements.....	9
2.2. Certification of NOx RACT.....	23
3. Adoption of Revised and/ or New RACT Requirements	28
3.1. Adoption of Revised and/or New VOC RACT Requirements	28
3.2. Revised and/or New NOx RACT Requirements	28
4. Control Technique Guideline (CTG) Requirements Not Adopted in Maryland	28
5. MDE Internal Consultation Process and EPA’s RACT/ BACT Clearinghouse.....	28
6. Reference Documents	29

Appendix A...RACT/BACT Clearinghouse Data Sheets

Appendix B...Copy of MDE RACT Questionnaire

Appendix C...Maryland’s List of RACT Major Sources

1. Introduction

This document consists of Maryland's State Implementation Plan (SIP) developed for the purpose of meeting the requirements of Reasonably Available Control Technology (RACT) set forth by the Clean Air Act (CAA) under the 8-hour ozone National Ambient Air Quality Standard (NAAQS). This document is hereafter referred to as "Maryland's 8-hour Ozone RACT SIP", or simply as "the RACT SIP."

1.1. Background and Requirements

Ground level ozone, one of the principal components of "smog," is a serious air pollutant that harms human health and the environment. High levels of ozone can damage the respiratory system and cause breathing problems, throat irritation, coughing, chest pains, and greater susceptibility to respiratory infection. High levels of ozone also cause serious damage to forests and agricultural crops, resulting in economic losses to logging and farming operations. On April 30, 2005, EPA designated 126 areas of the country as "nonattainment" under the 8-hour ozone NAAQS. Maryland's 8-hr Ozone Nonattainment Areas include the Baltimore Nonattainment Area, the Washington D.C. Nonattainment Area, and Cecil County, which is part of the Philadelphia Nonattainment Area. These three nonattainment areas are classified as moderate 8-hr Ozone Nonattainment Areas. Kent and Queen Anne's Counties, located on the Eastern Shore of Maryland, are classified as a marginal nonattainment area. In addition, Washington County, Maryland is classified as a basic nonattainment area (as Washington County is part of the Early Action Compact program.) All other remaining Maryland Counties are part of the Ozone Transport Region (OTR). Please reference Figure 1 and Figure 2 below.

Ozone is generally not directly emitted to the atmosphere; rather it is formed in the atmosphere by photochemical reactions between volatile organic compounds (VOC), oxides of nitrogen (NO_x), and carbon monoxide (CO) in the presence of sunlight. Consequently, in order to reduce ozone concentrations in the ambient air, the CAA requires all nonattainment areas to apply controls on VOC/NO_x emission sources to achieve emission reductions.¹ Among effective control measures, the Reasonably Available Control Technology (RACT) controls are a major group for reducing VOC and NO_x emissions from stationary sources.

The US Environmental Protection Agency (EPA) has defined RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility (44 FR 53761 at 53762, September 17, 1979). Section 182 of the CAA sets forth two separate RACT requirements for ozone nonattainment areas. The first requirement, contained in section 182(a)(2)(A) of the CAA, and referred to as RACT fix-up, requires the correction of RACT rules for which EPA identified deficiencies before the Act was amended in 1990. Maryland has no deficiencies to correct under this Section

¹The CAA does not specify requirements on CO emission reductions regarding ozone attainment.

of the CAA. The second requirement, set forth in section 182(b)(2) of the CAA, applies to moderate or worse ozone nonattainment areas as well as to marginal and attainment areas in ozone transport regions (OTRs) established pursuant to section 184 of the CAA, and requires these nonattainment areas to implement RACT controls on all major VOC and NOx emission sources and on all sources and sources categories covered by a control technique guideline document issued by EPA.

Under section 183 of the CAA, EPA was required to issue by certain timeframes several guidance documents for RACT controls that would help states meet the requirements of section 182(b)(2). This requirement upon EPA includes developing (1) Control Techniques Guideline (CTG) documents for controls of VOC emissions from stationary sources, and (2) Alternate Control Techniques (ACT) documents for controls of VOC and NOx emissions from stationary sources.

The EPA issued three groups of Control Techniques Guideline (CTG) documents, establishing a “presumptive norm” for RACT for various categories of VOC sources: Group I, issued before January 1978 including 15 CTGs; Group II, issued in 1978 including 9 CTGs; and Group III, issued in the early 1980s with 5 CTGs. Sources not covered by the issued CTGs are referred to as non-CTG sources. Section 182(b)(2) of the CAA requires states with ozone nonattainment areas classified as moderate or worse to develop RACT controls for all pre-enactment (i.e., pre-1990) CTG source categories, for all sources subject to post-enactment (i.e., post-1990) CTGs, and for all non-CTG major sources in their nonattainment areas. The EPA has also issued over a dozen ACTs for various categories of VOCs and NOx sources.

Figure 1. Maryland’s 8-Hour Ozone Nonattainment Areas

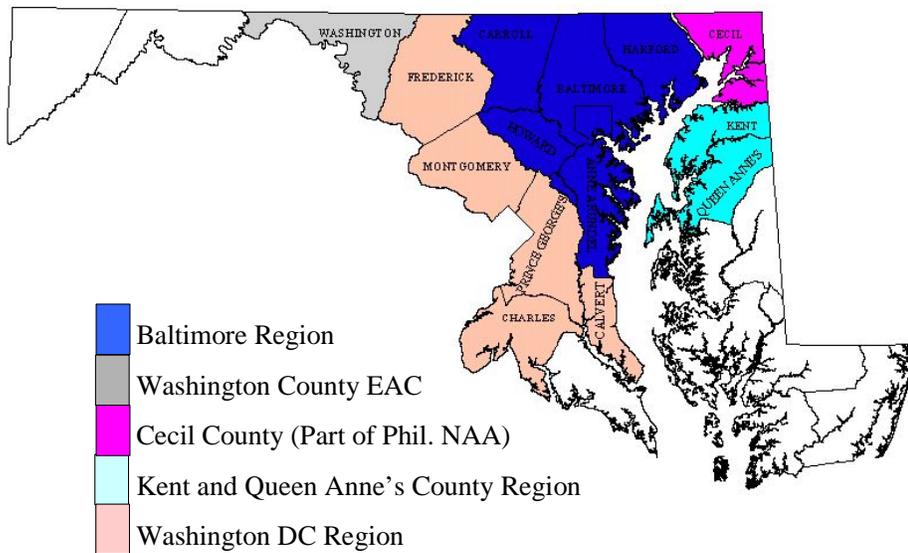
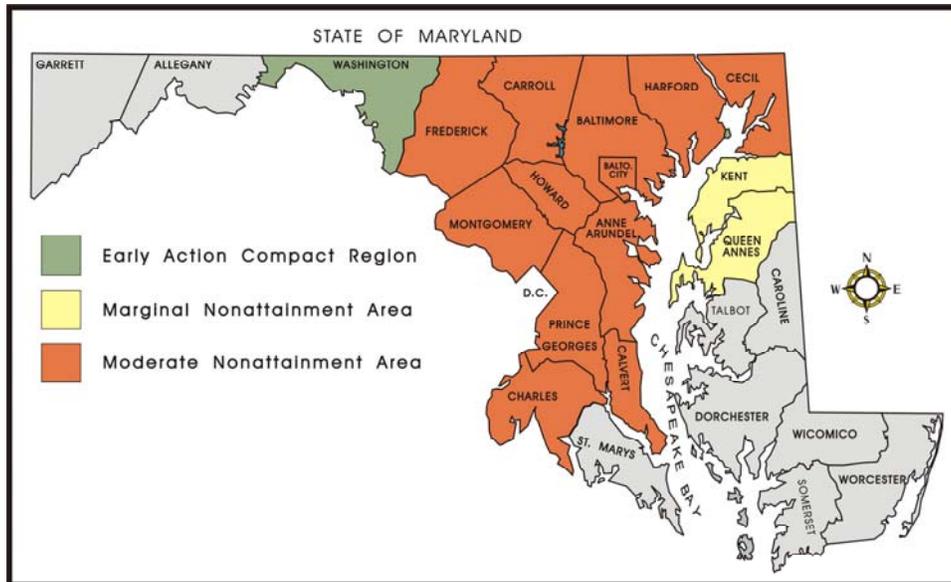


Figure 2. 8-Hour Ozone Classifications for Nonattainment Areas in Maryland



All published CTG and ACT documents, along with other documentation, are listed in Section 6 of this document. In general, states meet the CAA's RACT requirements by imposing controls that meet the control requirements established in final CTG documents and considering the information in ACT documents to relevant VOC and NO_x sources in their moderate or worse nonattainment areas.

Under the 1-hour ozone NAAQS, the Baltimore Nonattainment Area, the Washington D.C. Nonattainment Area, and Cecil County, Maryland were designated as severe ozone nonattainment areas. Kent and Queen Anne's counties were designated as a marginal 1-hr ozone nonattainment area. All remaining Maryland counties were identified as part of the OTR. Therefore, all Maryland counties were subject to RACT requirements under the 1-hour ozone standard. Since the early 1990s, Maryland has implemented numerous RACT controls throughout the State to meet the CAA's RACT requirements. These RACT controls were promulgated in COMAR 26.11.13, 26.11.19, 26.11.09.08

Maryland also implemented controls necessary to meet the requirements of the Federal NO_x SIP Call (40 CFR 51.121). This control program was promulgated in COMAR 26.11.29. For the purposes of meeting the NO_x RACT requirement, COMAR 26.11.29 ensures that sources subject to the cap-and-trade program of COMAR 26.11.29.04 -.14 achieve RACT level reductions because they meet the NO_x SIP Call requirements. Additionally, for the purposes of meeting the NO_x RACT requirement, COMAR 26.11.29.15(C) and 26.11.29.15(D) ensures that affected cement manufacturing

facilities and stationary internal combustion engines achieve RACT level reductions because they meet the NO_x SIP Call requirements of at least a 30 percent and 82 percent reduction, respectively, from uncontrolled levels (70 FR at 71653, November 29, 2005).

The entire state of Maryland is subject to the CAA's RACT requirements. Maryland is therefore required to submit to EPA a SIP, which addresses how Maryland meets the RACT requirements under the 8-hour ozone standard, by September 15, 2006. Under the 8-hour ozone NAAQS, EPA requires that states meet the CAA's RACT requirements for their nonattainment areas through (1) certification that previously adopted RACT controls in their SIP revisions approved by EPA under the 1-hour ozone NAAQS represent adequate RACT control levels for 8-hour attainment purposes, or (2) adoption of new or more stringent regulations that represent RACT control levels. A certification shall be accompanied by appropriate supporting information such as consideration of information received during the public comment period and consideration of new data, that may supplement existing RACT guidance documents that were developed for the 1-hour standard, such that State SIPs accurately reflect RACTs for the 8-hour ozone standard based on the current availability of technically and economically feasible controls. Adoption of new RACT regulation(s) shall occur when states have new stationary sources not covered by existing RACT regulations, or when new data or technical information indicates that a previously adopted RACT measure does not represent a newly-available RACT control level.

It should be pointed out that under the 8-hour ozone NAAQS, the majority of the State of Maryland is designated as a moderate nonattainment area, and all of Maryland is part of the OTR established under Section 184 of the CAA. Therefore, in this SIP document, Maryland considered sources equal to 50 tons per year (TPY) or more for non-CTG stationary VOC sources and 100 TPY or more for stationary NO_x sources. These are the major source thresholds for a moderate ozone nonattainment area. While 25-50 TPY VOC sources and 25-100 TPY NO_x sources are not specifically addressed in this SIP document, they remain subject to the 1-hour RACT requirements under the "anti-backsliding" provisions of the EPA 8-hour ozone implementation rule, 40 CFR Part 51, Subpart X (§§51.900-51.918). MDE expects that these thresholds will continue to hold as the major source thresholds under the 8-hour ozone NAAQS.

In summary, RACT is being certified for 25 TPY VOC and NO_x sources in the Baltimore, Washington DC and Cecil County Nonattainment areas and 50 TPY VOC and 100 TPY NO_x sources for all remaining Maryland counties. Maryland is also certifying through this SIP that, except as provided for herein, Maryland meets the CAA's RACT requirements for the 50 TPY non-CTG major VOC sources and for 100 TPY NO_x sources, and that all CTG covered categories are addressed at the cut-off level set in the CTG (or in "Issues Related To VOC Regulation Cutpoints, Deficiencies And Deviations, Clarification to Appendix D of November 24, 1987 Federal Register," dated May 25, 1988 (also known as the "Blue Book") for those CTG categories for which the original CTG set no cut-off). This certification is based on a combination of (1) certification that previously adopted RACT controls in Maryland's SIP that were approved by EPA under the 1-hour ozone NAAQS are based on the current availability of technically and

economically feasible controls and that they represent RACT for 8-hour implementation purposes, and (2) the adoption of new or more stringent regulations that represent RACT control levels.

1.2. Responsibilities

The agency with direct responsibility for preparing and submitting this document is the Maryland Department of the Environment (MDE), Air and Radiation Management Administration (ARMA), Air Quality Planning Program, managed by Ms. Diane L. Franks, Acting Program Manager and Brian J. Hug, Acting Deputy Program Manager.

2. Certification of VOC and NOx RACT Requirements

2.1. Certification of VOC RACT Requirements

Code of Maryland Regulations (COMAR) 26.11.13 and 26.11.19 represent Maryland's VOC RACT controls that were implemented and approved into the Maryland SIP under the 1-hour ozone NAAQS. In addition, Maryland also uses COMAR 26.06.06 to achieve significant reductions from unique VOC sources. Identification and certification of these VOC RACT controls is provided in Table 1 below. Explanations for each column of Table 1 are as follows:

- Column 1: Identifies each section of COMAR 26.11.13 and 26.11.19, Control of Volatile Organic Compound Emissions, which contains Maryland's VOC RACT provisions. COMAR 26.11.13 and 26.11.19 required major VOC emitting sources to comply with the relevant provisions by May 31, 1995. Under the 1-hour ozone standard, the VOC RACT regulation defines a major VOC emitting source as a stationary source that emits VOCs greater than or equal to 25 TPY in Maryland's severe nonattainment areas (Baltimore, Washington D.C., and Cecil County, Maryland), and 50 TPY in the remaining counties.
- Column 2: Explains RACT control applicability and requirements.
- Column 3: Identifies the underlying basis for the RACT determination.
- Column 4: Identifies the SIP number and the date in which the final rule appeared in the Federal Register.
- Column 5: Certifies whether or not the current rule represents RACT under the 8-hour ozone NAAQS. Where Maryland has certified that a current SIP approved regulation represents RACT under the 8-hour ozone standard, ARMA affirms that it is not aware of any significant changes in control technology that affect the original RACT determination, unless otherwise noted.

Maryland Small Source Requirement for VOCs

In regulation COMAR 26.11.02 Permits, Approvals and Registration, Maryland has established a comprehensive review process for minor sources. Sources exempted from the review process are subject to COMAR 26.11.02.10. VOC dispensing containers of 60 gallon capacity or less are exempt. Other similar small-scale operations qualify for exemption. Through keeping the Maryland exemption threshold extremely low, all other sources are included in the review process. The affected minor sources emit well below the major source and CTG threshold. The requirements of COMAR 26.11.02 ensure that all major and CTG sources are controlled by RACT at a minimum.

Table 1. Maryland VOC RACT Regulations under the 8-Hour Ozone NAAQS

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.03 Automotive Light Duty Truck Coating	Apply to automobile or light-duty truck assembly plants, and any can, coil, paper, fabric, or vinyl coating unit. Establish coating VOC content limits specific to operations.	CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977. (Group I)	SIP 98-01 11/5/1998 SIP 83-03 Parts A&B 9/10/1984	Yes. Consistent with the most recent CTG and represents the current RACT control level.
COMAR 26.11.19.04 Can Coating	Apply to automobile or light-duty truck assembly plants, and any can, coil, paper, fabric, or vinyl coating unit. Establish coating VOC content limits specific to operations.	CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977. (Group I)	SIP 83-03 9/10/1984	Yes. Consistent with the most recent CTG and represents the current RACT control level.
COMAR 26.11.19.05 Coil Coating	Apply to automobile or light-duty truck assembly plants, and any can, coil, paper, fabric, or vinyl coating unit. Establish coating VOC content limits specific to operations.	CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977. (Group I)	SIP 83-03 9/10/1984	Yes. Consistent with the most recent CTG and represents the current RACT control level.
COMAR 26.11.19.06 Large Appliance Coating	Requires use of compliant coatings with a VOC content of less 2.8 lbs/gal.	CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume V: Surface Coating of Large Appliances, EPA-450/2-77-034, December 1977. (Group I)	SIP 83-03 9/10/1984	Yes. Consistent with the most recent CTG and represents the current RACT control level.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.07 Paper, Fabric, Vinyl, and Other Plastic Parts Coating	<p>Apply to automobile or light-duty truck assembly plants, and any can, coil, paper, fabric, or vinyl coating unit.</p> <p>Establish coating VOC content limits specific to operations.</p>	CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977. (Group I)	<p>SIP 83-03 9/10/1984</p> <p>SIP 91-03 9/7/1994</p> <p>SIP 93-02 9/7/1994</p> <p>SIP 95-11 9/2/1997</p> <p>SIP 95-17 9/2/1997</p> <p>SIP 91-02 11/29/1994</p> <p>SIP 99-04 1/14/2000</p>	<p>Yes.</p> <p>Consistent with the most recent CTG and represents the current RACT control level.</p>
COMAR 26.11.19.07-1 Solid Resin Decorative Surface Manufacturing	Requires 75% control of emissions from solid resin decorative surface manufacturing operation with the help of a control device.	Maryland RACT analysis.	SIP 99-02 6/17/1999	<p>Yes.</p> <p>Represents the current level of control technology.</p>
COMAR 26.11.19.08 Metal Furniture Coating	Requires use of compliant coatings with a VOC content of less than 3.0 lb/gal.	CTG document: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume III: Surface Coating of Metal Furniture, EPA-450/2-77-032, December 1977.	SIP 83-03 9/10/1984	<p>Yes.</p> <p>Implements CTG and represents the current level of technology.</p>

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19 .09 Control of VOC Emissions from Cold and Vapor Degreasing	Requires the reformulation of cold degreasers to either aqueous solutions or low VOC formulations.	Maryland RACT analysis. CTG: Control of Volatile Organic Emissions from Solvent Metal Cleaning, EPA-450/2-77-022 November 1977. (Group I) ACT Document - Halogenated Solvent Cleaners, EPA-450/3-89-030, August 1989.Maryland RACT analysis.	SIP 95-09 8/4/1997 SIP 83-03 9/10/1984 SIP 92-01 9/7/1994	Yes. Based on cost effectiveness of controls. It is more stringent than the current CTG/ACT control level, and represents RACT control level under the 8-hour ozone NAAQS.
COMAR 26.11.19.10 Flexographic and Rotogravure	This regulation applies to any packaging rotogravure, publication rotogravure, or flexographic printing process at a facility. The rule establishes the limits of VOC contents in coatings and inks used in the covered facilities, and specifies standards for control devices for various printing processes.	Maryland RACT analysis. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VIII: Graphic Arts-Rotogravure and Flexography, EPA-450/2-78-033, December 1978. (Group II)	SIP 93-03 1/6/1995 SIP 95-11 9/2/1997 SIP 91-02 11/29/1994 SIP 83-03 9/10/1984 SIP 81-01 5/11/1982 SIP 93-05 1/6/1995	Yes. It is more stringent than the current CTG/ACT control level, and represents RACT control level under the 8-hour ozone NAAQS.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.11 Lithographic Printing	<p>Applies to offset lithographic printing, including heatset and non-heatset web, non-heatset sheet-fed, and newspaper facilities.</p> <p>A 90 percent reduction of VOC emissions (by weight) from the press dryer exhaust vent of heatset printing operations, limits the alcohol content in fountain solutions, and establishes standards for cleaning printing equipment.</p>	<p>CTG: Control of Volatile Organic Compound Emissions from Offset Lithographic Printing (CTG Draft), EPA-453/D-95-001, September 1993.</p> <p>ACT Document: Offset Lithographic Printing, EPA-453/R-94-054, June 1994.</p>	<p>SIP 91-02 11/29/1994</p> <p>SIP 95-11 9/2/1997</p> <p>SIP 91-03 9/7/1994</p>	<p>Yes.</p> <p>Consistent with the most recent CTG and represents the current RACT control level.</p>
COMAR 26.11.19.12 Dry Cleaning Installations	<p>Applies to petroleum dry cleaning facilities that consume 6000 gallons or more petroleum solvent per year.</p> <p>The rule establishes emission limits or reduction requirements for emissions, inspection, repair and reporting requirements for dryers, filtration systems and other equipment.</p>	<p>CTG: Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners, EPA-450/3-82-009, September 1982. (Group III)</p>	<p>SIP 81-01 5/11/1982</p> <p>SIP 83-03 9/10/1984</p> <p>SIP 91-02 11/29/1994</p> <p>SIP 98-02 9/2/1998</p> <p>SIP 91-03 9/7/1994</p>	<p>Yes.</p> <p>Consistent with the most recent CTG and represents the current RACT control level.</p>

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.13 Miscellaneous Metal Coating	Applies to any miscellaneous metal parts coating operation, and allows coatings with a VOC content in the range of 3.0 to 4.3 lb/gal.	CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VI: Surface Coating of Miscellaneous Metal Parts and Products, EPA-450/2-78-015, June 1978. (Group II)	SIP 91-02 11/29/1994 SIP 83-03 9/10/1984 SIP 81-01 5/11/1982	Yes. Consistent with the most recent CTG and represents the current RACT control level.
COMAR 26.11.19.13-1 Aerospace Coating Operations	Applies to aerospace coating operations and emission limits for coating types range from 1.3 to 3.5 pounds per gallon. For over 50 specialty coatings the standards go up to 10 lbs/gal.	40 CFR PART 63 SUBPART GG Aerospace Manufacturing and Rework and CTG EPA-453/R-97-004, October 1996.	SIP 00-10 11/7/2001 SIP 01-10 11/7/2001	Yes. Consistent with the most recent CTG and represents the current RACT control level.
COMAR 26.11.19-13-2 Brake Shoe Coating Operations	Applies to brake shoe coating operations establishes coating standards and equipment cleanup standards and requires high transfer efficiency methods for application of coating.	Maryland RACT analysis.	SIP 99-03 6/17/1999	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19-13-3 Control of Volatile Organic Compounds from Structural Steel Coating Operations	Coating standards are established for structural steel operations, which can only be exceeded from November to March by 20 %. Minimizes VOC emissions from cleaning solvents.	Maryland RACT analysis.	SIP 99-01 6/17/1999	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19-14 Manufacture of Synthesized Pharmaceutical Products	Establishes standards for the control of emissions from reactor, distillation operation, crystallizer centrifuge and vacuum dryer. Control efficiency of 90 percent or more. Vapor balance systems are also required.	CTG: Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products, EPA-450/2-78-029, December 1978 (Group II).	SIP 81-01 5/11/1982 SIP 83-03 9/10/1984 SIP 91-02 11/29/1994	Yes. Consistent with the most recent CTG and represents the current RACT control level.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.15 Paint, Resin and Adhesive and Adhesive Application	Applies to honeycomb core installation, footwear manufacturing and spiral tube winding and impregnating. Adhesive and resin standards are established for these operations.	Maryland RACT analysis.	SIP 99-10 10/28/1999 SIP 91-02 11/29/1994 SIP 93-02 11/30/1993	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.16 Control of VOC Equipment Leaks	Applies to operations that are subject to the requirements in COMAR 26.11.19 and without specific leak management.	Maryland RACT analysis. CTG - Control of Volatile Organic Compound Equipment Leaks from Synthetic Organic Chemical Manufacturing and Polymer Manufacturing Equipment, EPA-450/3-83-006, Nov. 1983.	SIP 91-03 9/7/1994	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.17 Control of Volatile Organic Compounds Emissions from Yeast Manufacturing	Applies to yeast manufacturing installation at a premises that has a potential to emit 25 tons or more per year of VOC. Sets emission standards based on the type of yeast fermenter. Requires continuous monitoring and reporting.	Maryland RACT analysis.	SIP 95-04 10/15/1997 SIP 04-09 10/27/2004 SIP 05-09 3/31/2006	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.18 Control of Volatile Organic Compound Emissions from Screen Printing and Digital Imaging.	Applies to screen printing operations on different substrates. The standards vary according to the substrate, type of printing and inks. Digital imaging and control device option is also included in the regulation.	Maryland RACT analysis.	SIP 99-05 6/17/1999 SIP 95-05 10/15/1997 SIP 02-04 1/15/2003	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.19 Control of Volatile Organic Compound Emissions from Expandable Polystyrene Operations	Applies to expandable polystyrene operations and control efficiency of 85 % is required for emissions from preexpander or combustion in a fire box.	Maryland RACT analysis	SIP 00-09 5/7/2001 SIP 95-08 10/15/1997	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.20 Control of Landfill Gas Emissions from Municipal Solid Waste Landfill	Applies to existing MSW landfills that have a design capacity equal to or greater than 2,750,000 tons and 3,260,000 cubic yards of MSW. Gas collection and control system is required if the emissions are calculated to be greater than 55 tons per year.	MACT requirements under 40 CFR 60.752 and 40 CFR 60.755	SIP 99-09 9/8/1999	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.21 Control of Volatile Organic Compounds from Bakery Ovens	Applies to an oven that has the potential to emit 25 tons or more. Controls are required based on predictive factors of 80 % or greater. The regulations also have provisions for the review and approval of innovative control technology.	Maryland RACT analysis.	SIP 95-10 10/15/1997	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.22 Control of Volatile Organic Compounds from Vinegar Generators	Applies to vinegar generation operation with emissions greater than 20 lbs/day. A scrubber-absorber system is required at 85 % or greater efficiency.	Maryland RACT analysis	SIP 98-09 9/23/1999	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.23 Control of VOC Emissions from Vehicle Refinishing	Applies to vehicle refinishing operations. Establishes coating, cleaning solvent and equipment standards	Alternative Control Techniques (ACT) document: Reduction of Volatile Organic Compound Emissions from Automobile Refinishing, EPA-450/3-88-009, October 1988. ACT: Automobile Refinishing, EPA-453/R-94-031, April 1994.	SIP 95-03 8/4/1997	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.24 Control of VOC Emissions from Leather Coating	Applies to a person who owns or operates a leather coating operation at a premise with actual VOC emissions of 20 pounds or more per day. Establishes coating standard and provides alternative means of compliance by controlling 85 % or more emissions.	Maryland RACT analysis.	SIP 98-08 9/23/1999	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.25 Control of Volatile Organic Compounds From Explosives and Propellant Manufacturing.	Applies to existing equipment at a premise that has a potential to emit 25 tons or more of VOC per year from all explosives and propellant manufacturing equipment. Establishes control efficiency requirement of 85% or more overall.	Maryland RACT analysis.	SIP 98-18 1/26/1999	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.26 Control of Volatile Organic Compound Emissions from Reinforced Plastic Manufacturing	Applies to reinforced plastic manufacturing operations if VOC emissions are 20 pounds or more per day. Requires the use of low styrene resin, high efficiency application equipment and low VOC cleaning solvents.	Maryland RACT analysis.	SIP 98-15 8/19/1999	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.27 Control of Volatile Organic Compound Emissions from Marine Vessel Coating Operations	Applies to marine vessel coating operations. Establishes over 20 coating standards, cleanup and record keeping requirements.	40 CFR PART 63 SUBPART II CTG "Control Techniques Guidelines for Shipbuilding and Ship Repair Operations (Surface Coating)" 61 FR 44050, August 27, 1996	SIP 98-17 9/5/2001	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.28 Control of Volatile Organic Compound Emissions from Bread and Snack Food Drying Operations	Applies to bread drying operation that has a potential to emit VOC emissions of 25 tons or more per year. Requires control of 85 % efficiency with the help of a scrubber or an alternative control device.	Maryland RACT analysis.	SIP 00-11 5/7/2001	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.29 Control of Volatile Organic Compound Emissions from Distilled Spirits Facilities	Applies to a distilled spirits facility that has a total potential to emit VOCs of 25 tons or more per year. Requires standards to be met for emptying barrels, cleaning of filters and filling of barrels.	Maryland RACT analysis.	SIP 00-12 11/7/2001 SIP 01-12 11/7/2001	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.19.30 Control of Volatile Organic Compound Emissions from Chemical Production and Polytetrafluoroethylene Installations	Applies to an organic chemical production installation or an inorganic chemical production installation with VOC emissions of 20 pounds or more per day. For emissions above 100 lbs/day, 90 % controls are required. Good operating practices apply if the emissions are less than 100 lbs/day.	Maryland RACT analysis. CTG - Control of Volatile Organic Compound Equipment Leaks from Synthetic Organic Chemical Manufacturing and Polymer Manufacturing Equipment, EPA-450/3-83-006, Nov. 1983.	SIP 01-03 7/20/2001 SIP 01-15 6/3/2003 SIP 02-07 6/3/2003	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.19.31 Control of Volatile Organic Compound Emissions from Medical Device Manufacturing		Maryland RACT analysis.	PENDING EPA ACTION SIP 06-04	Yes. The regulation implements cost effective controls for operations in Maryland and represents RACT control level.
COMAR 26.11.13.03(A) Control of Gasoline and Volatile Organic Compound Storage and Handling-Large Storage Tanks-Closed Top Tanks	Applies to gasoline liquid storage tanks with fixed roofs and with capacity of 40,000 gallons or greater. Covers sealing standards for a covered storage tank, openings, connection between roof edge and tank wall and vents.	CTG: Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed Roof Tanks, EPA-450/2-77-036, December 1977. (Group I)	SIP 81-01 5/11/1982 SIP 91-02 11/29/1994	Yes. Consistent with the most recent CTG and represents the current RACT control level.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
<p>COMAR 26.11.13.03(B) Control of Gasoline and Volatile Organic Compound Storage and Handling-Large Storage Tanks-Open Top tanks</p>	<p>Applies to gasoline storage tanks with external floating roofs and with capacity of 40,000 or greater.</p> <p>Incorporates sealing standards for a storage tank, including its openings, its connection roof and tank wall, all seal closure devices, vents, and emergency roof drains.</p>	<p>CTG: Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks, EPA-450-2/78-047, December 1978. (Group II).</p>	<p>SIP 83-03 9/10/1984</p>	<p>Yes.</p> <p>Consistent with the most recent CTG and represents the current RACT control level.</p>
<p>COMAR 26.11.13.04(A) Control of Gasoline and Volatile Organic Compound Storage and Handling Bulk Gasoline Terminals</p>	<p>Applies to all the loading racks at any bulk gasoline terminal that deliver liquid product into gasoline tank trucks.</p> <p>A vapor collection and control system designed to collect and destroy the organic compound liquids or vapors displaced from gasoline tank trucks during product loading is required and various other equipment and operational requirements are also included.</p>	<p>CTG: Control of Volatile Organic Emissions from Bulk Gasoline Plants, EPA-450/2-77-035, December, 1977. (Group I)</p>	<p>SIP 92-01 1/6/1995</p> <p>SIP 93-02 1/6/1995</p> <p>SIP 93-05 1/6/1995</p>	<p>Yes.</p> <p>Consistent with the most recent CTG and represents the current RACT control level.</p>
<p>COMAR 26.11.13.04 (C) Control of Gasoline and Volatile Organic Compound Storage and Handling-Small Storage Tanks</p>	<p>Applies to storage tanks with capacity greater than 2000 gallons but less than 40,000 gallons and requires Stage I vapor recovery.</p>	<p>CTG: Design Criteria for Stage I Vapor Control Systems - Gasoline Service Stations, November 1975. (Group I)</p>	<p>SIP 93-05 1/6/1995</p>	<p>Yes.</p> <p>Consistent with the most recent CTG and represents the current RACT control level.</p>

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.13.05 Control of Gasoline and Volatile Organic Compound Storage and Handling- Gasoline Leaks from Tank Trucks	Applies to gasoline tank trucks and requires compliance with standards for vapor-tightness.	CTG: Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals, EPA-450/2-77-026, December 1977. (Group I) CTG: Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems, EPA-450/2-78-051, December 1978. (Group II)	SIP 91-02 11/29/1994 SIP 81-01 5/11/1982 SIP 93-02 9/7/1994 SIP 83-03 9/10/1984	Yes. Consistent with the most recent CTG and represents the current RACT control level.
COMAR 26.11.24 Stage II Vapor Recovery at Gasoline Dispensing Facilities	Applies to facilities with average monthly throughput of 10,000 gallons or more. Requires regular inspection and testing of Stage II systems and includes record keeping and reporting.	CAA Section 182(b)(3).	SIP 93-01 6/9/1994 SIP 02-03 5/7/2003 SIP 95-18 8/4/1997	Yes. Consistent with the CAA and represents the most cost effective current RACT control level.
COMAR 26.11.11 Control of Petroleum Products Installations, including Asphalt Paving and Asphalt Concrete Plants	Applies to the manufacture, mixing, storage, use, and application of cutback and emulsified asphalts. Restricts cutback asphalt during the ozone season without approval.	CTG: Control of Volatile Organic Compounds from Use of Cutback Asphalt, EPA-450/2-77-037, December 1977. (Group I)	SIP 93-05 1/6/1995	Yes. Consistent with the most recent CTG and represents the current RACT control level.

Table 1 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Adoption Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.06.06 General Emission Standards Prohibitions and Restrictions-Volatile Organic Compounds	Applies to VOC emitting installations above 20 pounds per day. Emissions are required to be controlled by 85% or more.	CAA Section 182(b)(2)(C).	SIP 91-02 11/29/1994 SIP 83-03 9/10/1984 SIP 93-05 2/12/2001 SIP 98-05 5/7/2001 SIP 99-07 2/27/2003	Yes. Consistent with the CAA and represents the most cost effective current RACT control level.

Footnote to Table 1: Maryland's Major Sources, Applicable RACT Regulations and Emissions in Appendix C-

Under COMAR 26.11.05-1, General Administrative Provisions, Emission Statements, major sources of NO_x and VOC located in Baltimore City, Anne Arundel, Baltimore, Calvert, Carroll, Cecil, Charles, Frederick, Harford, Howard, Kent, Montgomery, Prince George's and Queen Anne's counties with emissions that exceed 25 tons or more during a calendar year are required to report emissions.

Sources located in Allegany, Caroline, Dorchester, Garrett, St. Mary's, Somerset, Talbot, Washington, Wicomico, or Worcester counties with actual emissions of either VOC or NO_x from all installations and emitting 50 tons or more of VOC or 100 tons or more of NO_x during a calendar year are also required to report emissions.

The emissions statements from major sources have been required from 1993. Data in Appendix C shows the applicable RACT regulation and the emissions from these sources as reported in 2004.

2.2. Certification of NOx RACT

Code of Maryland Regulations (COMAR) 26.11.09 represents Maryland's NOx RACT controls that were implemented and approved into the Maryland SIP under the 1-hour ozone NAAQS. Certification of those RACT rules is conducted in Table 2. Explanations for each column of Table 2 are as follows. Additionally, for the purposes of meeting the NOx RACT requirement, COMAR 26.11.29.15(C) and 26.11.29.15(D) ensures that affected cement manufacturing facilities and stationary internal combustion engines achieve RACT level reductions because it meets the NOx SIP Call requirements of at least a 30 percent and 82 percent reduction, respectively, from uncontrolled levels (70 FR at 71653, November 29, 2005).

- Column 1: Identifies each section of COMAR 26.11.09, Control of Nitrogen Oxide Emissions, which contains Maryland's NOx RACT provisions. 26.11.09 requires major NOx emitting sources to comply with the relevant provisions by May 31, 1995. The NOx RACT regulation defines a major NOx emitting source as a stationary source that emits NOx greater than or equal to 50 tons per year statewide.
- Column 2: Explains RACT control applicability and requirements.
- Column 3: Identifies the underlying basis for the RACT determination.
- Column 4: Identifies the SIP number and the date in which the final rule appeared in the Federal Register.
- Column 5: Certifies whether or not the current rule represents RACT under the 8-hour ozone NAAQS. Where Maryland has certified that a current SIP approved regulation represents RACT under the 8-hour ozone standard, ARMA affirms that it is not aware of any significant changes in control technology that affect the original RACT determination, unless otherwise noted.

Maryland Small Source Requirement for NOx

In regulation COMAR 26.11.02 Permits, Approvals and Registration, Maryland has established a comprehensive review process for minor sources. Sources exempted from the review process are subject to COMAR 26.11.02.10. Fuel burning equipment using gaseous fuels with heat input capacity of less than 1 mmBtu per hour are exempt. By keeping the Maryland exemption threshold low, all other sources are included in the review process. The affected minor sources emit well below the major source and CTG thresholds. The requirements of COMAR 26.11.02 ensure that all major and CTG sources are controlled by RACT at a minimum.

Table 2. Maryland NOx RACT Regulations under the 8-Hour Ozone NAAQS

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Final Rule Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.09.08 (E) Fuel burning equipment with an input capacity of 100 mmBTU/hr or less	<p>Applies to fuel burning equipment with a heat input capacity of 100 mmBtu/hr or less.</p> <p>Requires combustion analysis once every year and optimize combustion.</p>	<p><u>Summary of NOx Control Technologies and their and Extent of Application</u>, USEPA <u>Availability</u> February 1992</p> <p><u>State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990</u>, USEPA</p> <p>Memorandum Subject: <u>De Minimis Values for NOx RACT</u>, from G.T. Helms, Ozone Policy and Strategies Group, dated 1/1/1995</p>	<p>SIP 93-03 2/8/2001</p> <p>SIP 99-13 2/8/2001</p>	<p>Yes.</p> <p>The regulation implements the required NOx controls and represents the current RACT control level.</p>
COMAR 26.11.09.08(F) Requirements for Space Heaters	<p>Applies to space heaters. Development of operating and maintenance plan to minimize NOx emissions is required.</p>	<p><u>Summary of NOx Control Technologies and their and Extent of Application</u>, USEPA <u>Availability</u> February 1992</p> <p><u>State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990</u>, USEPA</p> <p>Memorandum Subject: <u>De Minimis Values for NOx RACT</u>, from G.T. Helms, Ozone Policy and Strategies Group, dated 1/1/1995</p>	<p>SIP 93-03 2/8/2001</p> <p>SIP 99-13 2/8/2001</p>	<p>Yes.</p> <p>The regulation implements the required NOx controls and represents the current RACT control level.</p>

Table 2 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Final Rule Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
<p>COMAR 26.11.09.08(G) Requirements for Fuel Burning Equipment with a Capacity Factor of 15 Percent or Less, and Combustion Turbines with a Capacity Factor Greater than 15 Percent</p>	<p>Applies to fuel burning equipment with a capacity factor of 15 percent or less and combustion turbines with a capacity factor of 15 percent or greater. Requires combustion analysis and optimization for NOx for fuel burning equipment. Gas fired turbines are required to meet NOx emission rate of 42 ppm and oil fired turbines are required to meet an emission rate of 65 ppm.</p>	<p><u>Alternative Control Techniques Document: NOx Emissions from Stationary Gas Turbines</u>, USEPA, January 1993</p> <p><u>NESCAUM Stationary Source Committee Recommendation on NOx RACT for Industrial Boilers, Internal Combustion Engines and Combustion Turbines</u> 9/18/1992</p> <p><u>Status Report on NOx Controls for Gas Turbines, Cement Kilns, Industrial Boilers, Internal Combustion Engines</u>, NESCAUM, December 2000</p> <p><u>Summary of NOx Control Technologies and their Availability and Extent of Application</u>, USEPA, February 1992</p> <p><u>Summary of State/Local NOx Regulations for Stationary Sources</u>, USEPA, 2004</p>	<p>SIP 93-03 2/8/2001</p> <p>SIP 99-13 2/8/2001</p>	<p>Yes.</p> <p>The regulation implements the required cost effective NOx controls and represents the current RACT control level.</p>
<p>COMAR 26.11.09.08(H) Requirements for Cement Manufacturing Facilities, Municipal Waste Combustors, and Hospital, Medical Waste Incinerators</p>	<p>Applies to cement manufacturing facilities, municipal waste combustors, and hospital, medical waste incinerators. Requires with NOx emission standards based on output capacity for cement kilns. For incinerators the emission standards are in COMAR 26.11.08.</p>	<p><u>Summary of NOx Control Technologies and their Availability and Extent of Application</u>, USEPA February 1992</p>	<p>SIP 95-13 2/8/2001 6/22/1999</p> <p>SIP 99-13 2/8/2001</p>	<p>Yes.</p> <p>The regulation implements the required cost effective NOx controls and represents the current RACT control level.</p>

Table 2 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Final Rule Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
<p>COMAR 26.11.09.08 (I) Requirements for Glass Melting Furnaces and Internal Combustion Engines at Natural Gas Pipeline Stations</p>	<p>Applies to glass melting furnaces and internal combustion engines at natural gas pipeline stations. Combustion optimization, monitoring and compliance with standards is required.</p>	<p><u>Summary of NOx Control Technologies and their Availability and Extent of Application</u>, USEPA February 1992</p> <p><u>Recommendation on NOx RACT for Industrial Boilers, Internal Combustion Engines and Combustion Turbines</u> 9/18/1992</p>	<p>SIP 95-13 2/8/2001 6/22/1999</p> <p>SIP 99-13 2/8/2001</p>	<p>Yes.</p> <p>The regulation implements the required cost effective NOx controls and represents the current RACT control level</p>
<p>COMAR 26.11.29.04-.014 Requirements for Trading Sources</p>	<p>Applies to an affected trading source that is:</p> <p>(1) Fossil fuel fired electric generating unit that serves a generator with a name plate capacity greater than 25.0 MW and sells any amount of electricity;</p> <p>(2) Nonelectric generating unit that has a maximum design heat input greater than 250 MMBtu per hour; and</p> <p>(3) Other source for which an opt-in application is submitted and approved by the Department.</p>	<p>For the purposes of meeting the NOx RACT requirement, COMAR 26.11.29 ensures that sources subject to the cap-and-trade program of COMAR 26.11.29.04 - .14 achieve RACT level reductions because they meet the NOx SIP Call requirements.</p> <p>EPA believes that the SIP provisions for those sources subject to the state's emission cap-and-trade program where the cap-and-trade program has been adopted by the State that meets the NOX SIP Call requirements meet the ozone NOX RACT requirement (70 FR at 71652, November 29, 2005).</p>	<p>SIP 00-05 1/10/2001</p> <p>SIP 03-09 3/22/2004</p>	<p>Yes.</p> <p>The regulation ensures RACT is demonstrated for affected cap-and-trade sources.</p>

Table 2 (continued)

Maryland Regulation	RACT Rule Applicability and Requirements	RACT Basis	SIP # & SIP Final Rule Date(s) Approved by EPA	RACT for the 8-hour ozone NAAQS
COMAR 26.11.29.15(C) Requirements for Affected Nontrading Sources	Applies to affected nontrading cement manufacturing facilities that have emissions of one or more ton of NOx per day averaged over the control period.	<p>“RACT is considered met for cement kilns and stationary internal combustion engines that are subject to a SIP approved as meeting the NOX SIP Call obligation to install and operate controls that are expected to achieve at least a 30 percent and 82 percent reduction, respectively, from uncontrolled levels.”</p> <p>“Final Rule To Implement the 8-Hour Ozone National Ambient Air Quality Standard—Phase 2” 70 FR 71612 at 71653, November 29, 2005.</p>	SIP 00-05 1/10/2001 SIP 03-09 3/22/2004	Yes. The regulation ensures RACT is demonstrated for affected cement kilns.
COMAR 26.11.29.15(D) Requirements for Internal Combustion Engines	Applies to affected nontrading facilities with internal combustion engines that have emissions of one or more ton of NOx per day averaged over the control period.	<p>“RACT is considered met for cement kilns and stationary internal combustion engines that are subject to a SIP approved as meeting the NOX SIP Call obligation to install and operate controls that are expected to achieve at least a 30 percent and 82 percent reduction, respectively, from uncontrolled levels.”</p> <p>“Final Rule To Implement the 8-Hour Ozone National Ambient Air Quality Standard—Phase 2” 70 FR 71612 at 71653, November 29, 2005.</p>	SIP 00-05 1/10/2001 SIP 03-09 3/22/2004	Yes. The regulation ensures RACT is demonstrated for affected stationary internal combustion engines.

Footnote to Table 2: Maryland’s Major Sources, Applicable RACT Regulations and Emissions in Appendix C- Under COMAR 26.11.05-1, General Administrative Provisions, Emission Statements, major sources of NOx and VOC located in Baltimore City, Anne Arundel, Baltimore, Calvert, Carroll, Cecil, Charles, Frederick, Harford, Howard, Kent, Montgomery, Prince George's and Queen Anne's counties with emissions that exceed 25 tons or more during a calendar year are required to report emissions.

Sources located in Allegany, Caroline, Dorchester, Garrett, St. Mary's, Somerset, Talbot, Washington, Wicomico, or Worcester counties with actual emissions of either VOC or NOx from all installations and emitting 50 tons or more of VOC or 100 tons or more of NOx during a calendar year are also required to report emissions.

The emissions statements from major sources have been required from 1993. Data in Appendix C shows the applicable RACT regulation and the emissions from these sources as reported in 2004.

3. Adoption of Revised and/ or New RACT Requirements

3.1. Adoption of Revised and/or New VOC RACT Requirements

As indicated in Table 1 above, many of Maryland's RACT controls (i.e., sections in COMAR 26.11.13 and 26.11.19, Control of Volatile Organic Compound Emissions) were implemented in 1990s to meet relevant requirements specified in the CAA and EPA's guidance documents. Several sections of COMAR 26.11.13 and 26.11.19 have been revised to meet updated RACT levels.

3.2. Revised and/or New NOx RACT Requirements

As indicated in Table 2 above, Maryland certifies that COMAR 26.11.09 and COMAR 26.11.29 appropriately implement NOx RACT controls in Maryland under the 8-hour ozone standard.

4. Control Technique Guideline (CTG) Requirements Not Adopted in Maryland

These CTGs have not been adopted in Maryland because there are no major sources of this type:

- Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires, EPA-450/2-78-030, December 1978. (Group II).
- Control of Volatile Organic Compound Emissions from Wood Furniture Manufacturing Operations, EPA-453/R-96-007, April 1996.
- CTG: Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants, EPA-450/2-83-007, December 1983 (Group III).
- CTG: Control of Volatile Organic Compound Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry, EPA-450/3-84-015, December 1984 (Group III).
- CTG: Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins, EPA-450/3-83-008, November 1983 (Group III).

5. MDE Internal Consultation Process and EPA's RACT/ BACT Clearinghouse

Maryland has over 600 high impact facilities that have been permitted by MDE's Air and Radiation Management (ARMA) Permits Program. On an annual basis the MDE' Air and Radiation Management Compliance Program performs approximately 2,000 inspections and audits. With the expertise of over 18,000 issued permits, a consultation process with ARMA's Permits and Compliance Programs was conducted during the development of this SIP, for information regarding the potential for RACT enhancement. There were no potential RACT enhancements identified during this consultation process. A copy of the survey used for this consultation process is included in the appendix of this report.

As part of its comprehensive review process to assure that all relevant RACT standards have been addressed and met, MDE reviewed EPA's RACT/BACT Clearinghouse database. Through its review, MDE did not observe any discrepancies between the database and the information generated from within the department. Maryland chose several of its largest emission source categories and provided in the appendix of this report, copies of the RACT/BACT Clearinghouse Data sheets for review.

6. Reference Documents

A. US EPA's Control Techniques Guidelines (CTG) documents, Alternative Control Techniques (ACT) documents, and Additional Reference Documents, *cited in this SIP Submittal for Determination of RACT Controls of VOC and NOx Emissions from Stationary Sources.*

1. Control Technology Guidance (CTG) document: Control of Volatile Organic Compound Emissions from Coating Operations at Aerospace Manufacturing and Rework Operations, EPA-453/R-97-004, December 1997.
2. Alternative Control Techniques (ACT) document: Reduction of Volatile Organic Compound Emissions from Automobile Refinishing, EPA-450/3-88-009, October 1988.
3. ACT: Automobile Refinishing, EPA-453/R-94-031, April 1994.
4. ACT: Surface Coating of Automotive/Transportation and Business Machine Plastic Parts, EPA-453/R-94-017, February 1994.
5. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977 (Group I).
6. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume III: Surface Coating of Metal Furniture, EPA-450/2-77-032, December 1977.
7. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume V: Surface Coating of Large Appliances, EPA-450/2-77-034, December 1977 (Group I).
8. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume IV: Surface Coating of Insulation of Magnet Wire, EPA-450/2-77-033, December 1977 (Group I).
9. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VI: Surface Coating of Miscellaneous Metal Parts and Products, EPA-450/2-78-015, June 1978 (Group II).
10. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VII: Factory Surface Coating of Flat Wood Paneling, EPA-450/2-78-032, June 1978 (Group II).
11. CTG: Control of Volatile Organic Emissions from Bulk Gasoline Plants, EPA-450/2-77-035, December, 1977 (Group I).
12. CTG: Design Criteria for Stage I Vapor Control Systems - Gasoline Service Stations, November 1975 (Group I).
13. CTG: Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals, EPA-450/2-77-026, December 1977 (Group I).

14. CTG: Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems, EPA-450/2-78-051, December 1978 (Group II).
15. CTG: Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds, EPA-450/2-77-025, October 1977 (Group I).
16. CTG: Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment, EPA-450/2-78-036, June 1978 (Group II).
17. CTG: Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks, EPA-450-2/78-047, December 1978 (Group II).
18. CTG: Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed Roof Tanks, EPA-450/2-77-036, December 1977 (Group I).
19. CTG: Control of Volatile Organic Emissions from Solvent Metal Cleaning, EPA-450/2-77-022 November 1977 (Group I).
20. ACT: Halogenated Solvent Cleaners, EPA-450/3-89-030, August 1989.
21. CTG: Control of Volatile Organic Compounds from Use of Cutback Asphalt, EPA-450/2-77-037, December 1977 (Group I).
22. CTG: Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products, EPA-450/2-78-029, December 1978 (Group II).
23. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VIII: Graphic Arts-Rotogravure and Flexography, EPA-450/2-78-033, December 1978 (Group II).
24. CTG: Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners, EPA-450/3-82-009, September 1982 (Group III).
25. Control of Volatile Organic Compound Equipment Leaks from Synthetic Organic Chemical Manufacturing and Polymer Manufacturing Equipment, EPA-450/3-83-006, Nov. 1983.
26. CTG: Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations in SOCFI, November 15, 1993, EPA-450/4-91-031.
27. ACT: Control of Volatile Organic Compound Emissions from Batch Processes, EPA-453/R-93-017, February 1994.
28. ACT Document: Industrial Cleaning Solvents, EPA-453/R-94-015, February 1994.
29. CTG: Control of Volatile Organic Compound Emissions from Offset Lithographic Printing (CTG Draft), EPA-453/D-95-001, September 1993.
30. ACT: Offset Lithographic Printing, EPA-453/R-94-054, June 1994.
31. ACT: Volatile Organic Liquids Storage in Floating and Fixed Roof Tanks, EPA-453/R-94-001, February 1994.
32. NESCAUM Stationary Source Committee Recommendation on NO_x RACT for Utility Boilers, 8/12/1992.
33. NESCAUM Stationary Source Committee Recommendation on NO_x RACT for Industrial Boilers, Internal Combustion Engines and Combustion Turbines, 9/18/1992.
34. Controlling Emissions of Nitrogen Oxides from Existing Utility Boilers Under Title I of the Clean Air Act: Options and Recommendations, STAPPA/ALAPCO, 4/27/1992.
35. State Implementation Plans; Nitrogen Oxides Supplement to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, USEPA, 10/27/1995.
36. Summary of NO_x Control Technologies and their Availability and Extent of Application, USEPA, February 1992.

37. Alternative Control Techniques Document: NO_x Emissions from Process Heaters (Revised), USEPA, September 1993.
38. Alternative Control Techniques Document: NO_x Emissions from Industrial/Commercial/Institutional (ICI) Boilers, USEPA, March 1994
39. Alternative Control Techniques Document: NO_x Emissions from Utility Boilers, USEPA, March 1994.
40. Status Report on NO_x Controls for Gas Turbines, Cement Kilns, Industrial Boilers, Internal Combustion Engines, NESCAUM, December 2000.
41. Summary of State/Local NO_x Regulations for Stationary Sources, USEPA, 2004.
42. Summary of NO_x Control Technologies and their Availability and Extent of Application, USEPA, February 1992.
43. Summary of NO_x Control Technologies and their Availability and Extent of Application, USEPA February 1992
44. Memorandum subject, Fuel Switching to Meet the Reasonably Available Control Technology (RACT) Requirements for Nitrogen Oxides (NO_x), Michael H. Shapiro, Air and Radiation, 7/30/1993
45. Memorandum subject, Nitrogen Oxides (NO_x) Questions from Ohio EPA, Tom Helms, Chief Ozone/Carbon Monoxide Programs Branch, (no date cited, references 11/30/1993 questions)
46. State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, USEPA.
47. Alternative Control Techniques Document: NO_x Emissions from Stationary Gas Turbines, USEPA, January 1993
48. Alternative Control Techniques Document: NO_x Emissions from Stationary Reciprocating Internal Combustion Engines, USEPA 1993.
49. NO_x Emissions from Stationary Internal Combustion Engines, USEPA, October 2003.
50. Stationary Reciprocating Internal Combustion Engines – Updated Information on NO_x Emissions and Control Techniques – Revised Final Report, USEPA, 9/1/2000.
51. Sourcebook: NO_x Control Technology Data, USEPA, July 1991.
52. Memorandum Subject: De Minimis Values for NO_x RACT, from G.T. Helms, Ozone Policy and Strategies Group, dated 1/1/1995.
53. Alternative Control Techniques Document: NO_x Emissions from Iron and Steel Mills, USEPA, September 1994.

B. Maryland VOC RACT Regulation

COMAR 26.11.13, 26.11.19, and 26.06.06: CONTROL OF VOLATILE ORGANIC COMPOUND EMISSIONS

<http://www.dsd.state.md.us/comar/>

(Note: Hard copy of this regulation available upon request.)

C. Maryland NO_x RACT Regulation

COMAR 26.11.09: CONTROL OF NITROGEN OXIDES EMISSIONS

<http://www.dsd.state.md.us/comar/>

(Note: Hard copy of this regulation available upon request.)