

## CHAPTER 6 REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT) ANALYSIS

### 6.1 Introduction

On **DATE, 2016**, EPA published a final rule finding that Colorado’s marginal ozone nonattainment area (Denver-Boulder-Greeley-Fort Collins-Loveland) failed to attain the 2008 ozone National Ambient Air Quality Standard (NAAQS) by the applicable marginal attainment deadline of July 20, 2015. Therefore, EPA reclassified Colorado’s ozone nonattainment area as moderate, requiring attainment of the 2008 ozone NAAQS no later than July 20, 2018, as demonstrated by the 2015-2017 ozone seasons<sup>1</sup>. Due to the reclassification, Colorado must submit a revised State Implementation Plan (SIP) that addresses the Clean Air Act’s (CAA) moderate nonattainment area requirements, as described in the final SIP Requirements Rule for the 2008 ozone NAAQS. These requirements include Reasonably Available Control Technology (RACT) and Reasonably Available Control Measures (RACM) analyses.

EPA defines RACT as the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. Because a RACT analysis takes into account the technological and economic impacts of controls, the analysis and determination may differ from source to source and location to location.

Under 40 CFR § 51.1112<sup>2</sup> and the reclassification<sup>3</sup>, Colorado’s SIP revision must provide for implementation of RACT as expeditiously as practicable, but no later than January 1, 2017, for categories of volatile organic compound (VOC) emission sources covered by an EPA Control Technique Guideline (CTG) and other major stationary sources of VOCs or nitrogen oxides (NOx) located in the nonattainment area. The VOC and NOx major stationary source thresholds for moderate nonattainment areas are the potential to emit 100 tons per year (tpy) or more.

This RACT analysis evaluates potential emission control options for source categories subject to a final CTG<sup>4</sup> and major sources of VOC or NOx in Colorado’s ozone nonattainment area. Colorado reviewed the CTGs and compared them to Colorado’s point source inventory and existing rules. Colorado also reviewed EPA’s Alternative Control Techniques (ACT), EPA’s Reasonable Available Control Technology, Best Available Control Technology, Lowest Achievable Emission Rate Clearinghouse (RBLC), EPA’s Menu of Control Measures (4/2/2010), federal New Source Performance Standards (NSPS), federal National Emission Standards for Hazardous Air Pollutants (NESHAP), and regulations applicable in other states’ ozone nonattainment areas for potential emission control measures. Any identified potential control measures or strategies were further evaluated to determine whether the measures were reasonably available considering technological and economic feasibility, and whether the measures could be implemented by January 1, 2017. Colorado similarly evaluated Colorado’s major VOC or NOx sources in the nonattainment area against the CTGs, ACT, RBLC, Menu of Control Measures, NSPS, and NESHAP for potential additional control measures.

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<sup>1</sup> NRDC v. EPA, 777 F.3d 456, 464-469 (D.C. Cir. 2014).

<sup>2</sup> Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements; Final rule March 6, 2015, 80 Fed. Reg 12264 at 12280, 12282, and 12316.

<sup>3</sup> Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, and Reclassification of Several Areas Classified as Marginal for the 2008 Ozone National Ambient Air Quality Standard; Proposed August 27, 2015, 80 Fed. Reg 51992 at 51998-51999.

<sup>4</sup> EPA published a draft CTG in 2015 to reduce VOC emissions from the oil and gas industry. Colorado regulations contain requirements for the oil and gas industry that achieve equivalent or greater emission reductions. However, Colorado is not presently submitting a RACT analysis for this source category because EPA has not published the final CTG. Colorado will address the oil and gas CTG within the time frame specified in the final CTG.

## 6.2 VOC Source Categories Analysis

Colorado reviewed the CTGs and compared them to Colorado’s existing rules and Colorado’s point source inventory to determine whether all CTG VOC emission source categories were subject to requirements that meet or exceed the applicable RACT requirements, or whether further emission controls or requirements were economically or technologically feasible or implementable by January 1, 2017. Colorado identified: (a) the VOC source categories for which Colorado does not have subject sources, supported by Appendix 6-A; (b) the VOC source categories for which Colorado has subject sources and general and source specific RACT requirements, supported by Appendix 6-B; (c) the VOC source categories for which Colorado has subject sources and has general but not source specific RACT requirements, supported by Appendices 6-C(a)-(e); and (d) other ACT VOC source categories for which there is not a corresponding CTG or Colorado source specific RACT requirements, supported by Appendix 6-D. Colorado also reviewed the ACTs, RBLC, EPA’s Menu of Control Measures, and regulations applicable to states with the same or more stringent ozone nonattainment areas<sup>5</sup> for other potentially economically and technologically feasible control technologies.

EPA has issued forty-four CTGs that recommend a particular level of control as being RACT. Colorado determined that Colorado does not have sources in some CTG VOC source categories, so a negative declaration satisfies Colorado’s RACT obligations. Colorado determined that Colorado has sources in CTG VOC source categories and has adequate general and source specific RACT requirements in Colorado Regulation 7. And, Colorado determined that Colorado has sources in CTG VOC source categories and has general but not source specific RACT regulatory requirements.

EPA has also issued twenty ACTs for sixteen categories of VOC emission sources, which do not recommend a particular emission level or control as being RACT. ACTs describe alternative controls a state may consider when developing RACT. The existence of an ACT for a source category does not trigger a requirement for states to develop or submit a RACT analysis. Of these ACTs, four are addressed by CTGs, three are addressed by federal consumer product rules, four are addressed by federal NSPS or NESHAP, and one concerns agricultural pesticides, which is not regulated by the Division. Colorado evaluated the remaining four ACT VOC source categories for which EPA has not issued a CTG and Colorado does not have source specific RACT requirements.

EPA has also issued ten ACTs for nine categories of NO<sub>x</sub> emission sources, which are addressed by federal NSPS or NESHAP, as summarized in Appendix 6-E. Colorado did not further analyze these ACTs for purposes of this RACT analysis because the RACT analysis relates to VOC source categories.

### 6.2.1 Negative Declaration

Colorado does not have sources in the following CTG VOC source categories, summarized in Appendix 6-A – CTGs – No Subject Colorado Sources.

- Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Paper, Fabrics, Automobiles, and Light-Duty Trucks (EPA 1977) and Control Techniques Guidelines for Paper, Film, and Foil Coatings (EPA 2007) and Control Techniques Guidelines for Automobile and Light-Duty Truck Assembly Coatings (EPA 2008)

<sup>5</sup> California Air Districts: South Coast, San Francisco Bay Area, San Joaquin Valley, Sacramento, and Ventura; Texas ozone nonattainment areas: Dallas-Fort Worth, Northeast Texas, Beaumont-Port Arthur, Houston-Galveston-Brazoria, Victoria, Corpus Christi, Austin-Round Rock, San Antonio, and El Paso; and Arizona Maricopa County. Note; some of these are serious or extreme ozone nonattainment areas.

- Control of Volatile Organic Emissions from Existing Stationary Sources – Volume IV: Surface Coating of Insulation of Magnet Wire (EPA 1977)
- Control of Volatile Organic Emissions from Existing Stationary Sources – Volume V: Surface Coating of Large Appliances (EPA 1977) and Control Techniques Guidelines for Large Appliance Coatings (EPA 2007)
- Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VII: Factory Surface Coating of Flat Wood Paneling (EPA 1978 ) and Control Techniques Guidelines for Flat Wood Paneling Coatings (EPA 2006)
- Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires (EPA 1978)
- Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VIII: Graphic Arts-Rotogravure and Flexography (EPA 1978)
- Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners (EPA 1982)
- Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins (EPA 1983)
- Control of Volatile Organic Compound Leaks from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment (EPA 1984)
- Control of Volatile Organic Compound Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry (EPA 1984)
- Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations in Synthetic Organic Chemical Manufacturing Industry (EPA 1993)
- Alternative Control Technology Document – Surface Coating Operations at Shipbuilding and Ship Repair Facilities (EPA 1994 ) and Control Techniques Guidelines for Shipbuilding and Ship Repair Operations (Surface Coating) (EPA 1996)
- Control Techniques Guidelines for Flexible Package Printing (EPA 2006)
- Control Techniques for Miscellaneous Plastic Parts Coatings (EPA 2008)
- Control Techniques Guideline for Fiberglass Boat Manufacturing Materials (EPA 2008)
- Control Technique Guidelines for Miscellaneous Industrial Adhesives (EPA 2008)

Not having subject sources, Colorado conducted no further analyses of these VOC source categories.

### 6.2.2 Colorado Source Specific Regulation of CTG VOC Source Categories

Colorado has sources in the following CTG VOC source categories. Colorado has adopted RACT requirements the same as or similar to the CTGs into Colorado's ozone SIP in Colorado's Regulation 7, Control of Ozone Via Ozone Precursors and Control of Hydrocarbons Via Oil and Gas Emissions, last approved by EPA in 2011 (August 5, 2011, 76 Fed. Reg. 47443). These CTGs are listed below, and summarized in Appendix 6-B – CTGs Colorado Has Adopted.

- Design Criteria for Stage I Vapor Control Systems – Gasoline Service Stations (EPA 1975)
- Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils (EPA 1977)
- Control of Volatile Organic Emissions from Solvent Metal Cleaning (EPA 1977)
- Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds (EPA 1977)
- Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals (EPA 1977)
- Control of Volatile Organic Emissions from Existing Stationary Sources – Volume III: Surface

Coating of Metal Furniture (EPA 1977) and Control Techniques Guidelines for Metal Furniture Coatings (EPA 2007)

- Control of Volatile Organic Emissions from Bulk Gasoline Plants (EPA 1977)
- Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed-Roof Tanks (EPA 1977)
- Control of Volatile Organic Emissions from Use of Cutback Asphalt (EPA 1977)
- Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VI: Surface Coating of Miscellaneous Metal Parts and Products (EPA 1978) and Control Techniques for Miscellaneous Metal Parts Coatings (EPA 2008)
- Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment (EPA 1978)
- Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products (EPA 1978)
- Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks (EPA 1978)
- Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems (EPA 1978)
- Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants (EPA 1983)

Colorado further analyzed each CTG in comparison to the respective Regulation 7 provisions to determine whether the provisions still meet the RACT obligation. Colorado also considered control strategies described in the RBLC, EPA’s Menu of Control Measures, and in other states’ ozone nonattainment areas.

EPA’s RBLC contains case-specific information on the “best available” air pollution technologies that have been required to reduce the emission of air pollutants from stationary sources, as provided by state and local permitting agencies. The RBLC was designed to help permit applicants and permit reviewers make pollution prevention and control technology decisions for stationary air pollution sources. The RBLC is searchable by facility state, company or facility name, pollutant, and process information, some of which relate to CTG VOC source categories. EPA’s Menu of Control Measures was developed to provide information to assist the identification and evaluation of potential control measures. The Menu of Control Measures notes that measures that are effective and cost-effective will vary by area due to the nature of and sources contributing to ozone issues in that area and that the costs of applying a control measure will also have case-specific considerations. Colorado considered the CTGs and these lists of control measures and determined that Colorado’s Regulation 7 requirements are similar to the measures described.

As detailed in Appendix 6-B, Colorado also found that Regulation 7 is similar to ozone nonattainment area regulations adopted by other states for pharmaceutical manufacturing, cutback asphalt, solvent metal cleaning, gasoline service stations, gasoline tank trucks, fixed and floating roof tanks, petroleum refineries, and natural gas processing plants. Colorado found regulations in other states that differ slightly from Regulation 7 for metal furniture surface coating VOC limits, miscellaneous metal parts coating VOC limits, can and coil coating VOC limits, inspection frequencies for gasoline loading and bulk terminals, and control efficiency for refinery vapory recovery systems. Colorado does not consider these differences to be material. Further, Colorado found that federal NSPS and NESHAP standards apply to many CTG VOC source categories.

Colorado determined that the existing provisions in Regulation 7 are still adequate and therefore RACT for all CTG VOC source categories identified in Appendix 6-B because: (1) Regulation 7 RACT for these CTG VOC source categories is consistent with controls or requirements recommended in the CTG and controls or requirements implemented in other nonattainment areas; (2) the CTG VOC source categories are regulated by federal NSPS and/or NESHAP; and/or (3) the cost for advancing a small additional increment of reduction is not reasonable, or implementable by January 1, 2017.

In the course of this review, Colorado found control strategies for some VOC source categories that are not addressed by a CTG or ACT. No additional RACT analysis is necessary for these source categories, but Colorado may consider them at a later date for potential future ozone reduction requirements.

### 6.2.3 No Colorado Source Specific Regulation of CTG VOC Source Categories

Colorado has sources in the following CTG VOC source categories for which Colorado's regulations contain general but not source specific RACT provisions, as summarized in Appendices 6-C(a)-(e).

- Aerospace (EPA 1994, 1997)
- Control of Volatile Organic Compound Emissions from Wood Furniture Manufacturing Operations (EPA 1996)
- Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing (EPA 2006)
- Control Techniques Guidelines for Industrial Cleaning Solvents (EPA 2006)
- Control of Volatile Organic Emissions from Perchloroethylene Dry Cleaning Systems (EPA 1978)

In analyzing each of these source categories, Colorado considered control strategies described in the CTGs, ACTs, RBLC, EPA's Menu of Control Measures, other ozone nonattainment areas, Colorado regulation, and current industry practices.

#### 6.2.3.1 Aerospace

Concerning aerospace, the CTG recommends specialty coating VOC contents of 60-1,230 g/L, application methods for primer and topcoats such as high volume low pressure spraying, and work practices for solvent cleaning such as closed containers, spill minimization, and hand-wipe cleaning with aqueous or VOC composite vapor pressure less than 45 mm Hg. While most regulations adopted by other states establish similar work practices, application methods, and VOC content limits, some states require emission control percentages and different VOC content limits. Colorado Regulation 7 establishes similar requirements that apply to Colorado's aerospace manufacturing sources: coating VOC limits of 3.0 to 4.3 lb/gal<sup>6</sup>; the use of high volume low pressure spray guns to minimize VOC emissions; solvent degreasing and cleaning requirements<sup>7</sup>; a prohibition of disposal of VOC by evaporation or spillage unless RACT is utilized<sup>8</sup>; and control techniques and work practices to reduce VOC emissions from fugitive sources such as, but not limited to, tight-fitting covers for open tanks, covered containers for solvent wiping cloths, and proper disposal of dirty cleanup solvent.<sup>9</sup> Thus, Colorado's general and other source specific RACT requirements are similar to the aerospace CTG.

<sup>6</sup> Colorado Air Quality Control Commission Regulation 7 Section IX.L.2.a.(ii); 3.0 to 4.3 lb/gal equates to 359 to 515 g/l.

<sup>7</sup> Colorado Air Quality Control Commission Regulation 7 Section X.

<sup>8</sup> Colorado Air Quality Control Commission Regulation 7 Section V.A.

<sup>9</sup> Colorado Air Quality Control Commission Regulation 7 Section IX.A.7.

### 6.2.3.2 Wood Furniture Manufacturing Operations

Concerning wood furniture manufacturing, the CTG recommends coating VOC content limits of 0.8-2.3 kg VOC/kg solids and work practice standards such as closed containers and spray equipment maintenance for sources that emit or have the potential to emit equal to or greater than 25 tons per year of VOCs. While other states' regulations establish similar VOC content limits, application methods, and work practices, some states require other VOC content limits and emission control percentages. Colorado Regulation 7<sup>10</sup> prohibits the disposal of VOC by evaporation or spillage unless RACT is utilized and requires all surface coating operations use control techniques and work practices to reduce VOC emissions from fugitive sources<sup>11</sup> such as, but not limited to, tight-fitting covers for open tanks, covered containers for solvent wiping cloths, and proper disposal of dirty cleanup solvent. Colorado only has one wood furniture manufacturing operation that exceeds the CTG applicability threshold and that source is a major source, thus subject to 40 CFR Part 63, Subpart JJ (National Emission Standards for Wood Furniture Manufacturing Operations). Combined, Colorado's general RACT requirements and the applicable NESHAP are similar to the wood furniture manufacturing CTG.

### 6.2.3.3 Offset Lithographic Printing and Letterpress Printing

Concerning lithographic printing, the CTG recommends 95% control of VOCs from heatset dryers or outlet concentration of 20 ppmv for heatset offset lithographic printing presses with the potential to emit at least 25 tpy VOC. The CTG recommends fountain solution for heatset web offset lithographic printing of 1.6 percent alcohol, and 5 percent alcohol for sheet-fed and coldset web printing with the potential to emit equal to or greater than 15 lb/day VOC. The CTG recommends cleaning materials with a VOC composite vapor pressure less than 10 mm Hg or containing less than 70 weight percent VOC and work practices such as closed containers for facilities with the potential to emit equal to or greater than 15 lb/day VOC. While other states' regulations establish similar VOC content limits and emission control percentages, some states require alternative VOC content limits or emission control percentages. Concerning Colorado's lithographic printing facilities, Colorado Regulation 7 prohibits the disposal of VOC by evaporation or spillage unless RACT is utilized<sup>12</sup>, generally closed containers and proper disposal practices. In addition, market forces have driven lithographic printers to use low or no-VOC inks and solutions, which reduce both financial and environmental costs.<sup>13</sup> Combined, Colorado's general RACT requirements and market forces are affecting VOC emission reductions, such that any additional reductions would be insignificant. Further, Colorado and Colorado's lithographic printing sources are unable to implement additional regulatory RACT requirements by January 1, 2017. However, Colorado continues to analyze these strategies for implementation after January 1, 2017.

### 6.2.3.4 Industrial Cleaning Solvents

Concerning industrial cleaning solvents used at facilities emitting VOC greater than 15 lb/day, the CTG recommends an organic solvent VOC content of 0.42 lb/gal or emission control of 85% and work practice standards including covered containers, proper disposal, and equipment practices. EPA

<sup>10</sup> Colorado Air Quality Control Commission Regulation 7 Section V.A.

<sup>11</sup> Colorado Air Quality Control Commission Regulation 7 Section IX.A.7.

<sup>12</sup> Colorado Air Quality Control Commission Regulation 7 Section V.A.

<sup>13</sup> Printers' National Environmental Assistance Center (PNEAC): Cleaner Technology Substitutes Assessment: Lithographic Blanket Washes; Vegetable Ester Blanket Washes; Digital Pre-press Reduces Waste; Alcohol Free Printing; Pollution Prevention: Fountain Solution Solutions; Pollution Prevention: Printing Inks; How to Reduce, Reuse and Recycle Lithographic Ink Wastes. <http://www.pneac.org/sheets/PrintingSector.cfm?PrintingSector=4>

intended the CTG to apply to industrial cleaning operations in the nine following cleaning categories: spray gun cleaning; spray booth cleaning; large manufactured parts cleaning; equipment cleaning; floor cleaning; line cleaning; parts cleaning; tank cleaning; and small manufactured parts cleaning. While other states' regulations also establish similar work practices, control requirements, and cleaning solvent VOC content, some states require different VOC content limits, higher emission control, and airless cleaning systems. Concerning industrial cleaning solvent use in Colorado, Colorado Regulation 7 prohibits the disposal of VOC by evaporation or spillage unless RACT is utilized<sup>14</sup>, generally closed containers and proper disposal practices. In addition, Colorado has found that industry practice has increasingly used services such as Safety-Kleen for parts cleaning and waste management as well as low VOC solvents due to solvent manufacturing trends and supply, which reduce both financial and environmental costs. For example, Safety-Kleen's heavy-duty hand wipes, spray and wipe cleaner degreaser, and heavy-duty cleaner degreaser all have VOC content less than 0.25 lb/gal. Combined, Colorado's general RACT requirements and market forces are affecting VOC emission reductions, such that any additional reductions would be insignificant. Further, Colorado and Colorado's industrial cleaning operations are unable to implement additional regulatory RACT requirements by January 1, 2017. However, Colorado continues to analyze these strategies for implementation after January 1, 2017.

#### 6.2.3.5 Perchloroethylene Dry Cleaning Systems

Concerning perchloroethylene dry cleaning, the CTG is no longer relevant because perchloroethylene has been exempted from the definition of VOC. Regardless, the federal NESHAP, 40 CFR Part 63 Subpart M (National Perchloroethylene Air Emission Standards for Dry Cleaning Facilities), achieves VOC control with refrigerated condensers and carbon adsorbers, leak inspection and repair, and work practices such as filter drainage, closed containers, and proper waste disposal. While other states' regulations require compliance with Subpart M, some states prohibit perchloroethylene dry cleaning system. The Division implements and enforces Subpart M; thus, Colorado is implementing RACT for perchloroethylene dry cleaning systems.

Colorado determined that Colorado's existing requirements for these CTG VOC source categories are consistent with the CTGs and satisfy RACT. In the case of lithographic printing and industrial cleaning solvents, industry practice and market forces have achieved additional VOC reductions, such that VOC control is similar to reductions achieved through the CTGs. Colorado evaluated including additional regulatory RACT requirements consistent with current practices for these industries and determined that potential additional emission reductions were minimal. Further, Colorado determined that implementation of such additional regulatory measures could not occur by January 1, 2017. Colorado statute<sup>15</sup> requires the Division to engage participants with an interest in the subject of a potential rule. While the participant engagement does not necessarily have to occur prior to the formal rule-making process, the Division considers it particularly necessary when engaging with an industry not previously regulated, such as offset lithographic printing or industrial cleaning operations. In addition, Colorado's rule-making process establishes at least a three month timeframe between a request for hearing before the Colorado Air Quality Control Commission (Commission) and hearing before the Commission to allow for party and public participation in the rule development. And prior to submission to EPA, the Colorado legislature must review Colorado SIPs and SIP revisions, which only occurs January through May.

<sup>14</sup> Colorado Air Quality Control Commission Regulation 7 Section V.A.

<sup>15</sup> Colorado Revised Statute Section 24-4-103.

Therefore, due to the time needed to engage participants, for the rule-making process, for legislative review, and for a source to implement any new requirements established through the rule-making process, sources potentially subject to the CTG source categories listed are unable to implement additional RACT by January 1, 2017, as required by 40 CFR Part 51, Section 51.1112(a)(3) and Colorado's reclassification.

#### **6.2.4 Non-CTG VOC Source Categories addressed by ACTs**

Of the ACT VOC source categories, four are not addressed by a CTG, federal consumer product rule, or federal NSPS or NESHAP. Colorado's regulations do not contain source specific RACT provisions for these source categories, as summarized in Appendix 6-D.

- Alternative Control Technology Document – Organic Waste Process Vents (EPA 1990)
- Alternative Control Technology Document – Bakery Ovens (EPA 1992)
- Industrial Wastewater Alternative Control Technology (EPA 1994 (1992 draft CTG, later issued as ACT))
- Control of Volatile Organic Compound Emissions from Batch Processes (EPA 1994)

In analyzing these sources, Colorado considered control strategies described in the ACTs, RBLC, EPA's Menu of Control Measures, and in other ozone nonattainment areas.

##### **6.2.4.1 Organic Waste Process Vents**

Concerning organic waste process vents, the ACT discusses controlling VOC emissions with vapor recovery control devices and combustion control devices from process vents. The ACT addresses process vents on waste management units (i.e., distillation and stripping operations) at treatment, storage, and disposal facilities (TSDF) treating wastes with total organics concentrations of less than 10 ppmv and treatment units part of a waste management system exempt from Resource Conservation and Recovery Act (RCRA) permitting. Due to facility variability, the ACT recommends that the choice of control technology be made on the basis of costs and cost effectiveness, thus on a case-by-case basis.

##### **6.2.4.2 Bakery Ovens**

Concerning bakery ovens, the ACT discusses controlling VOC emissions with combustion control devices. The ACT addresses ovens at large bakeries producing yeast-leavened bread, rolls, buns, and other similar products (e.g., bread production 6,000 to 29,000 tpy, VOC emissions 13 to 100 tpy). The ACT suggests analyzing potential emission control options for bakeries by identifying the cost effectiveness of controls for each oven and comparing to other facilities to determine the appropriate cost effective value, thus on a case-by-case basis. Other state requirements establish different emission control percentages.

##### **6.2.4.3 Industrial Wastewater**

Concerning industrial wastewater, the ACT discusses controlling VOC emissions through waste minimization and water treatment. The ACT addresses the collection and treatment of industrial wastewater from: the organic chemicals, plastics, and synthetic fibers industry; the pesticides manufacturing industry; the pharmaceuticals manufacturing industry; and the hazardous waste treatment, storage, and disposal facilities industry. EPA intended the ACT/CTG wastewater collection and treatment control to be consistent with the subsequently published Hazardous Organic NESHAP at



40 CFR Part 63, Subparts F, G, H, and I (HON) (59 FR 19402, April 22, 1994). While addressing HAP rather than just VOC, the HON wastewater provisions are recommended as the model wastewater rule. Other state requirements include cover and inspection requirements. The Division implements and enforces the HON.

#### 6.2.4.4 Batch Processes

Concerning batch processes, the ACT discusses reducing emissions from reactors, filters, dryers, distillation columns, extractors, crystallizers, and storage and transfer devices with condensers, scrubbers, carbon adsorbers, thermal incinerators, vapor containment systems, and operational practices. The ACT addresses batch processes in six industries: plastic materials and resins; pharmaceuticals; gum and wood chemicals; cyclic crudes and intermediates; industrial organic chemicals; and agricultural chemicals. Other state requirements establish specific control percentages.

Colorado Regulation 7 establishes work practice requirements similar to the ACTs and prohibits the disposal of VOC by evaporation or spillage unless RACT is utilized, generally closed containers and proper disposal practices.

ACTs describe alternative controls states may consider when developing RACT but do not recommend a particular level or control as being RACT. Further, these ACT VOC source categories are not also CTG VOC source categories<sup>16</sup>. Therefore, while Colorado evaluated these ACTs, Colorado is not required under 40 CFR Section 51.1112 to make RACT conclusions for these source categories. However, Colorado may continue to analyze these strategies for implementation at a later date.

### 6.3 Major Source Analysis

Moderate ozone nonattainment areas must implement RACT for major stationary sources of VOCs or NO<sub>x</sub> in the nonattainment area. The VOC and NO<sub>x</sub> major stationary source thresholds for moderate nonattainment areas are the potential to emit 100 tons per year (tpy) or more. As with RACT for the CTG VOC source categories, RACT is the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. Similarly, RACT for major sources must be implemented as expeditiously as practicable but no later than January 1, 2017.

Colorado reviewed Colorado's point source inventory to verify that major sources of VOC or NO<sub>x</sub> emissions in the nonattainment area are subject to requirements that meet or exceed RACT, or whether further emission controls on the sources were economically or technologically feasible or implementable by January 1, 2017. Colorado reviewed Colorado's point source inventory and found 46 major VOC or NO<sub>x</sub> stationary sources in the nonattainment area. Colorado reviewed the sources' operating permits and consulted with knowledgeable staff of the Division's permit and enforcement programs. Colorado also considered control strategies in the CTGs, ACTs, RBLC, EPA's Menu of Control Measures, NSPS, NESHAP, and Colorado regulation.

EPA's RBLC contains case-specific information on the "best available" air pollution technologies that

<sup>16</sup> 40 CFR § 51.1112(a)(1) For each nonattainment area classified Moderate or higher, the state shall submit a SIP revision that meets the VOC and NO<sub>x</sub> RACT requirements in CAA sections 182(b)(2) and 182(f). CAA § 182(b)(2) The State shall ...include provisions ... with respect to each of the following: (A) Each category of VOC sources in the area covered by a CTG document issued by the Administrator between November 15, 1990, and the date of attainment. (B) All VOC sources in the area covered by any CTG issued before November 15, 1990.

have been required to reduce the emission of air pollutants from stationary sources, as provided by state and local permitting agencies. EPA’s Menu of Control Measures was developed to provide information to assist the identification and evaluation of potential control measures. Colorado considered these lists of control measures and determined that Colorado’s major sources are subject to requirements similar to measures described.

Colorado determined that either RACT has been determined for these sources (i.e., NSPS or NESHAP/MACT applicability, Regulation 7 RACT requirements, or BACT analyses) or that the sources are unable to implement additional control strategies by January 1, 2017, due to the time required for rule-making, permitting<sup>17</sup>, and/or source implementation, as described above. For the sources where additional, potentially feasible emission control or reduction measures cannot be implemented by January 1, 2017, Colorado continues to analyze these strategies for implementation after January 1, 2017, as noted in Appendix 6-F.

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<sup>17</sup> Operating permit application completeness determination – 60 days, operating permit or major modification application processing – 18 months, minor operating permit modification processing – 90 days. Colorado Regulation 3, Part C, Sections IV.B. IV.C., X.H.

**Appendix 6-A – CTGs – No Subject Colorado Sources**

Date of CTG	Description	Colorado rule	Date of Colorado adoption	Date of most recent EPA approval of Colorado Regulation 7
1977 (ACT 1994)	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Paper, Fabrics, Automobiles, and Light-Duty Trucks	Regulation 7 Sections V. and IX.	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)
2007	Control Techniques Guidelines for Paper, Film, and Foil Coatings	Regulation 7 Sections V. and IX.	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)
2008	Control Techniques Guidelines for Automobile and Light-Duty Truck Assembly Coatings	Regulation 7 Sections V. and IX.	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)
1977	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume IV: Surface Coating of Insulation of Magnet Wire	Regulation 7 Sections V. and IX.	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)
1977	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume V: Surface Coating of Large Appliances	Regulation 7 Sections V. and IX.	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)
2007	Control Techniques Guidelines for Large Appliance Coatings	Regulation 7 Sections V. and IX.	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)
2008	Control Techniques for Miscellaneous Plastic Parts Coatings	Regulation 7 Sections V. and IX.	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)
1978	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VII: Factory Surface Coating of Flat Wood Paneling	Regulation 7 Sections V. and IX.	12/14/1978 and 9/20/1989	8/5/2011 (76 FR 47443)
2006	Control Techniques Guidelines for Flat Wood Paneling Coatings	Regulation 7 Sections V. and IX.	12/14/1978 and 9/20/1989	8/5/2011 (76 FR 47443)
1978	Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires	Regulation 7 Sections V. and IX.	12/14/1978 and 9/20/1989	8/5/2011 (76 FR 47443)
1978	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VIII: Graphic Arts-Rotogravure and Flexography	Regulation 7 Sections V. and XIII.	12/14/1978 and 12/4/1980	8/5/2011 (76 FR 47443)
1982	Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners	Regulation 7 Section V.	12/14/1978	8/5/2011 (76 FR 47443)
1983	Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins	40 CFR Part 60 Subpart JJJ	12/14/1978	8/5/2011 (76 FR 47443)
1984	Control of Volatile Organic Compound Leaks from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment	40 CFR Part 63 Subparts U, JJJ	12/14/1978	8/5/2011 (76 FR 47443)
1984	Control of Volatile Organic Compound Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry	Regulation 7 Section V.	12/14/1978	8/5/2011 (76 FR 47443)
1993	Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations in Synthetic Organic Chemical Manufacturing Industry	40 CFR 60, Subpart III	12/14/1978	8/5/2011 (76 FR 47443)
1994	Alternative Control Technology Document – Surface Coating Operations at Shipbuilding and Ship Repair Facilities	Regulation 7 Section V.	12/14/1978	8/5/2011 (76 FR 47443)
		40 CFR Part 63 Subpart II	12/14/1978	8/5/2011 (76 FR 47443)

Date of CTG	Description	Colorado rule	Date of Colorado adoption	Date of most recent EPA approval of Colorado Regulation 7
1996 (ACT 1994)	Control Techniques Guidelines for Shipbuilding and Ship Repair Operations (Surface Coating) <i>EPA Note – See also EPA-453/R-94-032.</i>	Regulation 7 Section V. 40 CFR Part 63 Subpart II	12/14/1978	8/5/2011 (76 FR 47443)
2006	Control Techniques Guidelines for Flexible Package Printing	Regulation 7 Section V. 40 CFR Part 63 Subparts JJJ, KK	12/14/1978	8/5/2011 (76 FR 47443)
2008	Control Techniques Guideline for Fiberglass Boat Manufacturing Materials	Regulation 7 Section V. 40 CFR Part 63 Subpart VVV	12/14/1978	8/5/2011 (76 FR 47443)
2008	Control Technique Guidelines for Miscellaneous Industrial Adhesives	Regulation 7 Section V. 40 CFR Part 60 Subpart RR, 40 CFR Part 63 Subparts KK, JJJ	12/14/1978	8/5/2011 (76 FR 47443)

Appendix 6-B – CTGs Colorado Has Adopted

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1975	Design Criteria for Stage I Vapor Control Systems – Gasoline Service Stations <u>EPA Note</u> – This document is regarded as a CTG although it was never published with an EPA document number.	Regulation 7 Sections V. and VI. 40 CFR Part 63 Subpart CCCCC	12/14/1978	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Equip pumps and compressors with mechanical seals or other of equal efficiency, equip storage tanks with floating roof and vapor gathering system, routine tank inspections, submerged fill and vapor control system, load leak tight transport trucks and vapor collection system	Stage I controls, vapor balance systems, submerged fill, leak tight conditions, vapor collection systems	California: transfer vapor recovery system, vapor tight and liquid tight lines and connections, bottom fill, tank floating roof seals and covers, routine inspections, certified spill box, cargo tank vapor integrity testing, cannot purge gasoline from cargo tank to atmosphere, closed containers Texas: submerged fill, vapor control system, vapor tight transport vessels, tank control with submerged fill/vapor control system/or floating roof, routine inspections Arizona: submerged fill and pressure/vacuum valve, vapor recovery system, tank floating roof seals, routine inspections, vapor-tight and leak-tight transport vessels, control delivery vessel purge emissions 90%
1976	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume I: Control Methods for Surface Coating Operations <u>EPA Note</u> – Although often listed with the CTGs for historical reasons, this document does not define RACT for any source. It is a compilation of control techniques.	NA – compilation of control techniques				RBL: stage I and II vapor recovery system	

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1977	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils	Regulation 7 Sections V, and IX. 40 CFR Part 60, Subparts TT, WW 40 CFR Part 63, Subparts KKKK, SSSS	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Fugitive VOC control – covers, closed containers, proper disposal Can coating VOC content limit 2.8 to 5.5 lb/gal Coil coating VOC content limit 2.6 lb/gal	Cans – coating VOC content limit 2.8 to 4.2 lb/gal; available control options: incineration, water-borne/high solids/powder coatings, carbon adsorption, ultraviolet curing Coils – coating VOC content limit 2.6 lb/gal; available control options: incineration, water-borne/high solids coatings	California: cans – coating VOC content 0.1-5.5 lb/gal, coating VOC content 20-750 g/l, cleaning solvent VOC content 0.21-0.23 lb/gal, may comply with 90% control, application methods, closed containers; coils – coating VOC content 1.7 lb/gal, VOC content 200 g/l, cleaning solvent VOC content 0.21-0.23 lb/gal, may comply with 90% control, application methods, closed containers Texas: can coating VOC content 2.8-5.5 lb/gal, coil coating VOC content 2.6 lb/gal Arizona: can coating VOC content 2.5-5.5 lb/gal, coil coating VOC content 2.6 lb/gal, alternative control device 90%, application methods, closed containers, spray gun cleaning practices RBL: can – NSPS WW, compliant coatings, thermal oxidation, cleaning solvent and ink VOC content Menu: incineration, total enclosure, process modifications, VOC content limits

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1977	Control of Volatile Organic Emissions from Solvent Metal Cleaning	Regulation 7 Sections V. and X.	12/14/1978	8/5/2011 (76 FR 47443)	<p>Cannot dispose of VOC by evaporation or spillage unless RACT utilized</p> <p>Control solvent cold-cleaners with covers and drainage facility; control non-conveyORIZED vapor degreasers with covers, safety switches, and control systems; control conveyORIZED degreasers with control devices, drying tunnel, safety switches, covers</p>	<p>Equipment specifications, operating requirements, minimize solvent loss, repair equipment, control devices</p>	<p>California: cold cleaners use covers, dry rack, freeboard ratio or control 85-95% or enclosed design; open top and conveyORIZED vapor degreasers free of liquid leaks, and transfer with leak proof couplings, safety switches, freeboard ratio; VOC content limit 0.42 lb/gal; may comply with airtless/air-tight cleaning system; repair leaks; closed containers</p> <p>Texas: cold-cleaning use cover and enclosed draining, open top degreasing use cover and freeboard ratio or control 85%, conveyORIZED degreasing control with refrigerated chiller 85% or carbon adsorption and trying tunnel</p> <p>Arizona: closed containers, internal drainage rack, impervious cover, drying tunnel, may control with control or sealed system</p> <p>RBLC: vapor condensing/recovery system, operating time limit</p>

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1977	Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds	Regulation 7 Sections V, and VIII. 40 CFR Part 60 Subpart QQQ	12/14/1978	8/5/2011 (76 FR 47443)	One major source – see Table 6	Process unit turnarounds operating procedures, vacuum producing system firebox combustion, wastewater separators covers, process depressurized flare/fuel system/other combustion device before opening	California: control and minimize flaring, operate flares in smokeless manner, maintain flare pilot flames, routine inspections, collect vapors when depressurizing vessels, cover wastewater separators and sumps and sewer lines and process drains, control emissions from vacuum producing system, cover hot wells and accumulators  Texas: components with water seals, closed openings, junction box vents control 90% or enclosed system, routine inspections, control steam ejector or mechanical vacuum pump vent stream 90%, control hotwell emissions, recover emissions during turnaround, equip water separator with vapor recovery system  RBLC: MACT CC, NESHAP FF, NSPS QQQ, covered system, vapor combustor, good air pollution control practices, submerged fill
1977	Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals	Regulation 7 Sections V., and XV. 40 CFR Part 60 Subpart XX 40 CFR Part 63 Subparts R, BBBBBB	12/14/1978 and 4/9/1981	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized  Equip pumps and compressors with mechanical seals or other of equal efficiency, equip storage tanks with floating roof and vapor gathering system, routine tank inspections, submerged fill and vapor control system, load leak tight transport trucks and vapor collection system	California: transfer vapor recovery system, vapor tight and liquid tight lines and connections, bottom fill, tank floating roof seals and covers, routine inspections, certified spill box, cargo tank vapor integrity testing, cannot purge gasoline from cargo tank to atmosphere, closed containers  Texas: submerged fill, vapor control system, vapor tight transport vessels, tank control with submerged fill/vapor control system/or floating roof, routine inspections  Arizona: submerged fill and pressure/vacuum valve, vapor recovery system, tank floating roof seals, routine inspections, vapor-tight and leak-tight transport vessels, control delivery vessel purge emissions 90%  RBLC: submerged fill, minimize spills, vapor recovery unit	California: transfer vapor recovery system, vapor tight and liquid tight lines and connections, bottom fill, tank floating roof seals and covers, routine inspections, certified spill box, cargo tank vapor integrity testing, cannot purge gasoline from cargo tank to atmosphere, closed containers  Texas: submerged fill, vapor control system, vapor tight transport vessels, tank control with submerged fill/vapor control system/or floating roof, routine inspections  Arizona: submerged fill and pressure/vacuum valve, vapor recovery system, tank floating roof seals, routine inspections, vapor-tight and leak-tight transport vessels, control delivery vessel purge emissions 90%  RBLC: submerged fill, minimize spills, vapor recovery unit



Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1977	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume III: Surface Coating of Metal Furniture	Regulation 7 Sections V, and IX. 40 CFR Part 60 Subpart EE 40 CFR Part 63 Subpart RRRR	12/14/1978 and 5/22/1980	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Fugitive VOC control – closed covers, proper disposal Coating VOC content limit 3.0 lb/gal	Coating VOC content limit 3.0 lb/gal Coating VOC content limit 2.3 to 3.5 lb/gal Optional add-on control device Application methods Cleaning material work practices – closed containers, minimize spills	California: coating VOC content limits 2.3 to 5.8 lb/gal, may comply with control 85-95%, closed containers, minimize spills, specified application methods, cleaning solvent VOC content limit 0.42 lb/gal unless control 85%, clean spray equipment with non-organic solvent, stripper VOC content limit 1.7 lb/gal, substrate surface cleaning VOC content limit 0.21 lb/gal Texas: coating VOC content limit 2.3 to 5.1 lb/gal, closed containers, minimize spills, specified application methods Arizona: coating VOC limit 3.0 lb/gal, specified application method, closed containers EPA Menu: CTG, reformulation or process modification (see SCAQMD), reduced solvent utilization, permanent total enclosure
2007	Control Techniques Guidelines for Metal Furniture Coatings	Regulation 7 Sections V., and XV. 40 CFR Part 60 Subpart XX 40 CFR Part 63 Subparts R, BBBB	12/14/1978 and 4/9/1981	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Equip pumps and compressors with mechanical seals or other of equal efficiency, equip storage tanks with floating roof and vapor gathering system, routine tank inspections, submerged fill and vapor control system, load leak tight transport trucks and vapor collection system	Vapor collection systems, leak tight conditions, submerged fill	California: transfer vapor recovery system, vapor tight and liquid tight lines and connections, bottom fill, tank floating roof seals and covers, routine inspections, certified spill box, cargo tank vapor integrity testing, cannot purge gasoline from cargo tank to atmosphere, closed containers Texas: submerged fill, vapor control system, vapor tight transport vessels, tank control with submerged fill/vapor control system/or floating roof, routine inspections Arizona: submerged fill and pressure/vacuum valve, vapor recovery system, tank floating roof seals, routine inspections, vapor-tight and leak-tight transport vessels, control delivery vessel purge emissions 90% RBLC: submerged fill, minimize spills, vapor recovery unit

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1977 (ACT 1994)	Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed-Roof Tanks	Regulation 7 Sections V and VI. 40 CFR Part 60 Subpart K, Kb 40 CFR Part 63 Subpart CC, EEEE, BBBBBB	12/14/1978	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized  Fixed roof seals and vapor gathering system, routine inspections	Equipment specifications, internal floating roof or equivalent, maintenance requirements, inspections  (ACT expanded to chemical plants)	California: vapor loss control device, control tank degassing and cleaning emissions 90-95%, tank floating roof seals, routine inspections, bottom loading, maintain facility leak-free and vapor-tight, low emission fixed liquid level gauges and connectors  Texas: maintain working pressure to prevent vapor or gas loss to atmosphere, control with submerged fill or vapor control system or floating roof, floating roof seal inspections  Arizona: tanks with floating roof or vapor collection system, floating roof seals, routine inspections  EPA Menu: seals (see SCAQMD)  RBLC: submerged fill, aluminum or white color, vapor balancing, fuel specification, MACT CC, internal floating roof, RTO, good design, operating practices, enclosed combustor, stage I and II

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1977	Control of Volatile Organic Emissions from Use of Cutback Asphalt	Regulation 7 Sections V and XI.	12/14/1978	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Sources subject to R7 use limitation Oct-Feb	Substitute emulsions for cutback asphalt	California: cutback asphalt < 0.5 % organic compounds that evaporate at < 500F; emulsified asphalt < 3% organic compounds that evaporate at < 500F; no rapid or medium-cure liquid asphalt; slow-cure liquid asphalt < 0.5% petroleum solvents that boil at < 500F (exemption when temp for 24 hour < 50F); no cutback asphalt in South Zone  Texas: cutback asphalt limited to < 7% of total annual volume; no cutback asphalt April 16-Sept 15; asphalt emulsion VOC content 0.5 to 12% by weight; exemption for cutback asphalt as penetrating prime coat  Arizona: no rapid cure cutback asphalt; cutback asphalt < 0.5% VOC that evaporates at < 500F; emulsified asphalt < 3% VOC that evaporates at < 500F; exemption for non-rapid cure cutback asphalt as a penetrating prime coat  EPA Menu: reformulation, process modification
1978	Control Techniques for Volatile Organic Emissions from Stationary Sources <i>EPA Note – This document is often listed with CTGs, but it does not define RACT for any particular source.</i>	NA – compilation of control techniques					
1978	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VI: Surface Coating of Miscellaneous Metal Parts and Products	Regulation 75 Sections V and IX. 40 CFR Part 63, Subpart M M M M	12/14/1978 and 12/4/1980	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Fugitive VOC control – closed covers,	Coating VOC content limit 3.0 to 4.3 lb/gal; available control options: incineration, water-borne/high solids/powder coatings, carbon adsorption	California: coatings VOC content 2.3-7.3 lb/gal, VOC content 60-680 g/l, cleaning solvent VOC content 0.21-0.23 lb/gal, may comply with 85-95% control, closed containers, application methods  Texas: coatings VOC content 2.3-6.7 lb/gal.

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
2008	Control Techniques for Miscellaneous Metal Parts Coatings				<p>containers, proper disposal</p> <p>Coating VOC content limit 3.0 to 4.3 lb/gal</p>	<p>Coating VOC content limit 2.3 to 6.2 lb/gal; application methods; alternative use of add-on control; work practices (closed containers, minimize spills)</p>	<p>application methods, work practices</p> <p>Arizona: coating VOC content 3.0-3.5 lb/gal, alternative control device 90%, application methods, closed containers, spray gun cleaning practices</p> <p>RBL: consumption limits, VOC content 3.5-7.25 lb/gal, HVL, closed containers, carbon adsorption</p> <p>Menu: VOC content limits, add-on control, CTG</p>
1978	Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment	<p>Regulation 7 Sections V, and VIII.</p> <p>40 CFR Part 60 Subparts GGG, GGGa, J, Ja</p> <p>40 CFR Part 63 Subpart CC</p>	12/14/1978	8/5/2011 (76 FR 47443)	One major source – see Table 6	Leak detection and repair	<p>California: leak detection and repair (7 days), routine inspections; vent PRD to vapor recovery or disposal system, leak thresholds: equipment, connector, and valves &gt; 100 ppm, pump, compressor, and PRD &gt; 500 ppm, components, connections, flanges, pumps, compressors, PRD &gt; 200 to 10,000 ppmv; repair 0 to 7 days; reinspect after repair; cap/seal open-ended lines and valves</p> <p>Texas: routine inspection, step up/down inspection frequency option, repair leaks, leak thresholds: pumps and compressors 2000 ppm and other components 500 ppm</p> <p>EPA Menu: process modification, flare gas recovery unit, flaring limits and operational practice (see SCAQMD)</p> <p>RBL: quarterly leak detection and repair, MACT H, NESHAP V, MACT CC, NSPS GGGa, MACT FFFF</p>

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1978	Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products	Regulation 7 Sections V., IX., and XIV. 40 CFR Part 63, Subpart GGG	12/14/1978 and 9/20/1989 and 12/4/1980	8/5/2011 (76 FR 47443)	<p>Cannot dispose of VOC by evaporation or spillage unless RACT utilized</p> <p>Fugitive VOC control – closed covers, containers, proper disposal</p> <p>Control emissions from reactors, distillation operations, crystallizers, centrifuge and vacuum dryers with surface condensers or equivalent controls; vapor balance system for transfer from truck or railcar to storage tanks; enclose centrifuges, rotary vacuum filters, other filters; covers on in-process tanks; repair leaks; closed containers</p>	<p>Controls (e.g., condensers, scrubbers, carbon adsorbers, vapor return lines, conservation vents, pressure tanks) for dryers, storage reactors, distillation units, and transfer, filters, extractors, centrifuges, crystallizers; may be reasonable to regulate on plant by plant basis</p>	<p>California: control reactors, distillation columns, crystallizers, centrifuges with surface condensers or equivalent; enclose centrifuges and vacuum filters; tank covers; operational requirements; closed containers</p> <p>Texas: control reactors, distillation units, crystallizers, centrifuges, vacuum dryers with condenser; cover in-process tanks; control air dryers, production equipment exhaust system, loading facilities 90%</p> <p>Arizona: control reactor, distillation column, crystallizer, centrifuge with surface condenser or equivalent; cover in-process tanks; control vacuum filter, other filter, and separation device 90%; control chemical sterilizer 75%; control air dryer 90%; repair leaks; closed containers</p> <p>EPA Menu: equipment and operational requirements (see SCAQMD)</p> <p>RBLC: scrubbers, incinerator, carbon adsorption, RTO, LDAR</p>

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1978 (ACT 1994)	Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks	Regulation 7 Sections V, and VI. 40 CFR Part 60 Subpart K, Kb	12/14/1978	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Floating roof seals, covered roof drains, covered/sealed openings, routine inspections	Equipment specifications, seals, maintenance requirements, inspections	California: vapor loss control device, control tank degassing and cleaning emissions 90-95%, tank floating roof seals, routine inspections, bottom loading, maintain facility leak-free and vapor-tight, low emission fixed liquid level gauges and connectors  Texas: maintain working pressure to prevent vapor or gas loss to atmosphere, control with submerged fill or vapor control system or floating roof, floating roof seal inspections  Arizona: tanks with floating roof or vapor collection system, floating roof seals, routine inspections  EPA Menu: seals (see SCAQMD)  RBLC: submerged fill, aluminum or white color, vapor recovery, seals, drain dry design bottoms, NSPS Kb, MACT BBBBB, limited roof landings, good engineering practices, LDAR, dome, MACT CC
1978	Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems	Regulation 7 Sections V., and XV. 40 CFR Part 60 Subpart XX 40 CFR Part 63 Subparts R, BBBBBB	12/14/1978 and 4/9/1981	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Annual leak-tight test, semi-annual visual inspections	Leak tight conditions, vapor collection systems	California: vapor integrity test, cannot purge gasoline vapor from cargo tank to atmosphere, vapor and liquid leak free connectors  Texas: annual leak-tight test  Arizona: vapor tight and leak free vessels, annual leak test, vapor return hoses, collect and contain spills, cannot purge vapors from delivery vessel unless control 90%  RBLC: vapor tight vessels, submerged fill, RTO, vapor combustor

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of Most Recent EPA approval of Colorado Regulation 7	Summary of Colorado Regulation requirements	Summary of requirements	Summary of other requirements or regulations – for comparison
1983	Control of Volatile Organic Compound Leaks from Natural Gas/Gasoline Processing Plants	Regulation 7 Sections V, and XII. 40 CFR Part 60 Subpart KKK, OOOO, OOOOa (proposed)	12/14/1978 and 3/12/2004	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized NSPS level fugitive emission LDAR	Leak detection and repair	California: leak detection and repair EPA Menu: natural gas production compressors SCR RBLC: thermal oxidizers, flare, diesel engine operation limits, LNB, ULNB, FGR, bottom filling tanks, aluminum or white tanks, fugitive LDAR, heater burner control, good combustion practices, floating roof tanks, enclosed oil-water separator, NSPS OOOO, dehy vapor recovery unit, enclosed combustor
2015 (proposed)*	Control Techniques Guidelines for the Oil and Natural Gas Industry	Regulation 7 Sections V, XII., XVII., and XVIII. 40 CFR Part 60 Subparts OOOO, OOOOa (proposed)	12/14/1978 and 3/12/2004 and 12/17/2006 and 12/12/2008	Section V. – 8/5/2011 (76 FR 47443) Section XII. – 2/3/2008 (73 FR 8194)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized 90% system wide tank controls, 95% individual tank control, no tank venting, 95% centrifugal compressor control, rod packing replacement compressors, low or no bleed pneumatic controllers, leak detection and repair at well sites/compressor stations/gas plants, liquids unloading BMPs, route gas to sales line or control	PROPOSED: 95% tank control, well completion requirements, 95% centrifugal compressor control, rod packing replacement reciprocating compressors, low or no bleed pneumatic controllers, zero emission pneumatic pumps, leak detection and repair at well sites/compressor stations/gas plants	California: concentration of TOC in well cellar < 500 ppmv, cannot store organic liquid in well cellar, control gas 95%, repair gaseous leaks > 250 ppmv, routine inspections, odor event cause analysis and report, repair component leaks > 10,000 ppmv, closed access hatches, control emissions from glycol dehy 95%, vapor recovery system on crude oil storage tanks, control crude oil storage tank degassing emissions 95%, power drilling operations with grid power EPA Menu: reduce fugitive emissions (see SCAQMD)

Appendix 6-C(a) – CTGs Colorado Could Consider Adopting – Aerospace

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of EPA approval of Colorado Regulation 7	Colorado requirements	CTG recommendations	Other requirements or regulations – for comparison
1994 (1997)	Aerospace (CTG & NESHAP) <i>EPA Note – See also 59 FR-29216, June 6, 1994.</i>	Regulation 7 Sections V. and IX. 40 CFR Part 63 Subpart GG	12/14/1978 and 12/4/1980	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized  Fugitive VOC control – closed covers, containers, proper disposal  Coating VOC limit 3.5 lb/gal	Specialty coating VOC content limits 60-1230 g/l (exempt if use < 50 gal/yr), cleaning solvent subject to work practices (closed containers), control VOC emissions through substitution (e.g., waterborne and high solids materials) and equipment changes (e.g., high transfer efficiency spray guns, spray gun cleaners, and conventional transfer methods)  Manufactured metal parts CTG coating VOC content limits 1.7 to 5.8 lb/gal	California: coatings VOC content limits 120 to 1000 g/l, coating VOC content limits 1.3 to 8.3 lb/gal, maskant VOC content limit < 600 g/l, may control 85%, strippers VOC content limit < 2.5 lb/gal, surface preparation VOC content limit < 1.67 lb/gal, cleaning solvent VOC limit 0.21 to 1.67 lb/gal, cleaning solvent w/o VOC or control 95%, coatings ROC content limit 0.4 to 8.3 lb/gal, cleaning solvent ROC content limit < 200 g/l, stripper ROC content limit < 300 g/l, specified application methods, closed containers  Texas: coatings VOC content limits 60 to 1230 g/l, specified application methods, specified spray gun cleaning practice  Arizona: coatings VOC content limits 60 to 1030 g/l, may comply with control 81%, specified application methods or 65% transfer efficiency, cleaning solvent VOC composite vapor pressure < 45 mm Hg, closed containers  EPA Menu: CTG  RBL: MACT GG, low pressure or hand application, good work practices, low VOC coatings and solvents
	Facility	Permitted VOC emissions, tpy	Estimated actual VOC emissions, tpy	Requirements			
	Lockheed Martin Space Systems (059-0099)	60	2.51	Coating VOC content limits (3.5 lb/gal), HVLP, fugitive VOC emission control, cleaning/degreasing control			
	Ball Aerospace (013-0084 & 059-0083)	50 & 25	7.99 & 10.51	Coating VOC content limits (3.0-4.3 lb/gal), HVLP, fugitive VOC emission control, NESHAP HHHHH,, cleaning/degreasing control			



Appendix 6-C(b) – CTGs Colorado Could Consider Adopting – Wood Furniture Manufacturing Operations

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of EPA approval of Colorado Regulation 7	Colorado requirements	CTG recommendations	Other requirements or regulations – for comparison
1996	Control of Volatile Organic Compound Emissions from Wood Furniture Manufacturing Operations <i>EPA Note – Wood Furniture (CTG-MACT) – Draft MACT out 5-1994; Final CTG issued 4-1996. See also 61 FR-25223, May 20, 1996 and 61 FR-50823, September 27, 1996.</i>	Regulation 7 Sections V, and IX. 40 CFR Part 63 Subpart JJ	12/14/1978 and 9/20/1989	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized Fugitive VOC control – closed covers, containers, proper disposal	Combustion or recovery device, low VOC coatings (0.8-2.3 kg VOC/kg solids), prevention, work practices (e.g., closed containers)	California: coatings VOC content limits 0.25 to 6.3 lb/gal, coatings ROC content 2.0 to 6.3 lb/gal, stripper VOC content < 250 g/l, may comply with control 85-90%, specified application methods, closed containers, cleaning solvent VOC content 0.21 lb/gal Texas: coatings VOC content limits 0.8 to 2.3 kg VOC/kg solids or vapor control system equivalent reduction, cleaning solvent VOC content < 8% VOC, prohibits conventional spray gun Arizona: coatings VOC content 1.8 to 2.3 lb VOC/lb solids, specified application methods, cleaning solvent VOC content < 8% VOC, closed containers EPA menu: CTG RBLC: coating reformulation, proper spraying techniques, paint filter
Facility	Elkay Wood Products (001-1602)	Permitted VOC emissions, tpy	Estimated actual VOC emissions, tpy	Requirements	See major source Table 6		
		249	131				

Appendix 6-C(c) – CTGs Colorado Could Consider Adopting – Offset Lithographic Printing and Letterpress Printing

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of EPA approval of Colorado Regulation 7	Colorado requirements	CTG recommendations	Other requirements or regulations – for comparison
2006 (ACT 1993, 1994)	Control Techniques for Offset Lithographic Printing and Letterpress Printing	Regulation 7 Section V.	12/14/1978	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized	Reduce emissions from fountain solution by limiting alcohol to < 5%, cleaning materials with VOC composite vapor pressure < 10 mm Hg or < 70% VOC (excluding 110 gal noncompliant cleaning materials), work practices (closed containers), reduce emissions from heatset dryers ≥ 25 tpy VOC with control devices 90-95% (no recommended control from sheet-fed or coldset web)	California: Ink VOC content limits 1.25 to 2.5 lb/gal, fountain solution limit 1.6 to 8% VOC, cleaning product VOC limit 0.21 to 0.83 lb/gal, may comply with control 75%, closed containers, specified application methods  Texas: low solvent ink < 25% VOC or high solids solvent ink > 60% nonvolatile material or vapor control system 90% reduction, fountain solution alcohol content < 5% by volume alcohol (heatset) or < 10% (sheet-fed) or no alcohol (non-heatset printing newspapers), cleaning solvent VOC content < 50% by volume VOC, closed containers  EPA Menu: CTG  RBL: fountain solution VOC content, work practices, thermal oxidizer, water based material VOC content, equipment design
	Facility	Permitted VOC emissions, tpy	Estimated actual VOC emissions, tpy	Requirements			
	Frederic Printing (001-0262)	77.2	20.07	Non-heatset-sheetfed-offset printing, low VOC inks, fugitive emission control			
	Ross Printing (001-0631)	13.5	5.37	Sheetfed-offset printing, heatset printer with thermal oxidizer, fugitive emission control			
	Mido Printing (001-0940)	10.41	3.08	Non-heatset-sheetfed printing, low VOC inks, fugitive emission control			
	Fuse Inc (001-1967)	5	3.96	Non-heatset-sheetfed printing, biorenewable vegetable and aqueous based inks, fugitive emission control			
	Siler Printing (001-1979)	5	3.96	Non-heatset-sheetfed printing, fugitive emission control			
	Cottrell Printing (005-1114)	4.9	4.779	Non-heatset-sheetfed printing, fugitive emission control			
	D&K Printing (013-0496)	12	4.21	Non-heatset-sheetfed printing, soy-based inks, water miscible/low odor/low VOC cleanup solvent, fugitive emission control			
	Publication Printers (031-0234)	24	13.02	Heatset web, sheetfed offset, non-heatset web printing, low VOC inks, fugitive emission control, afterburner			
	Lange Graphics (031-1271)	22	10.6	Non-heatset-sheetfed printing, low VOC ink, 90% UV inks, fugitive emission control			
	American Web (031-1363)	21	10.67	Heatset web offset printing, low VOC inks, fugitive emission control, catalytic converter			
	Adams McClure (031-1781)	15	10	Non-heatset-sheetfed and heatset web and heatset offset printing, low VOC inks, fugitive emission control			

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of EPA approval of Colorado Regulation 7	Colorado requirements	CTG recommendations	Other requirements or regulations – for comparison
	Sprint Denver (031-1800)	12.5	8.73	Non-heatset-sheetfed printing, fugitive emission control			
	Colorado Plasticard (059-0439)	35	18.7	Non-heatset-sheetfed printing, water based inks, fugitive emission control			
	Citizen Printing (069-0244)	6.32	3.08	Non-heatset-sheetfed printing, low VOC ink, fountain solution < 5%, fugitive emission control			



Appendix 6-C(d) – CTGs Colorado Could Consider Adopting – Industrial Cleaning Solvents

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of EPA approval of Colorado Regulation 7	Colorado requirements	CTG recommendations	Other requirements or regulations – for comparison
2006 (ACT 1994)	Control Techniques Guidelines for Industrial Cleaning Solvents	Regulation 7 Section V.	12/14/1978	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized	Work practice standards, cleaning materials VOC content limit 0.42 lb/gal, optional alternative limit on composite vapor pressure of cleaning materials, controls reduction 85%	<p>California: cleaning solvent VOC content limit 0.21 to 6.7 lb/gal, may comply with control 85-95%, consumer paint thinner VOC content limit 0.21 lb/gal, specified cleaning methods, closed containers</p> <p>Texas: solvent VOC content &lt; 0.42 lb/gal or vapor control system 85% reduction, closed containers, minimize emissions</p> <p>Arizona: solvent VOC content &lt; 0.42 lb/gal, work practices if not using low-VOC solvent (i.e., 0.42 lb/gal), closed containers</p> <p>EPA Menu: CTG</p> <p>RBLC: vapor condensing/recovery system, operating time limit</p>
Facility	Unknown	Permitted VOC emissions, tpy	Estimated actual VOC emissions, tpy	Requirements	VOC disposal requirements, industry practices		

**Appendix 6-C(e) – CTGs Colorado Could Consider Adopting – Perchloroethylene Dry Cleaning Systems**

Date of CTG	Description	Colorado and federal rules	Date of Colorado adoption	Date of EPA approval of Colorado Regulation 7	Colorado requirements	CTG recommendations	Other requirements or regulations – for comparison
1978	Control of Volatile Organic Emissions from Perchloroethylene Dry Cleaning Systems – <i>EPA Note – Perchloroethylene has been exempted as a VOC, so this CTG is no longer relevant. However, there is a NESHAP for perchloroethylene dry cleaners.</i>	Regulation 7 Section V. 40 CFR Part 63 Subpart M	12/14/1978	8/5/2011 (76 FR 47443)	Cannot dispose of VOC by evaporation or spillage unless RACT utilized	Carbon adsorbers, cookers and cartridge filters, waste disposal, leak detection	California: prohibits the installation of new perchloroethylene dry cleaning systems
	Facility	Estimated perchloroethylene tpy	actual emissions,	Requirements			
	108 in ozone nonattainment area	72.89		Sources subject to 40 CFR Part 63, Subpart M			

**Appendix 6-D – ACT VOC source category**

Date of ACT	Description	Other rules	Summary conclusion
1983	Control Techniques for Organic Emissions from Plywood Veneer Dryers	40 CFR Part 63 Subpart DDDD	No further action at this time – see MACT
1988	Reduction of Volatile Organic Compound Emissions from the Application of Traffic Markings	National Volatile Organic Compound Emission Standards for Architectural Coatings	No further action at this time – see consumer products rule
1989	Alternative Control Technology Document – Ethylene Oxide Sterilization/Fumigation Operations	40 CFR Part 63 Subparts O, XX, WWWWWW	No further action at this time – see MACT
1989	Alternative Control Technology Document – Halogenated Solvent Cleaners	40 CFR Part 63 Subpart T	No further action at this time – see MACT
1990	Alternative Control Technology Document – Organic Waste Process Vents		No action at this time – not a CTG VOC source category
1990	Control of VOC Emissions from Polystyrene Foam Manufacturing	40 CFR Part 63 Subpart III, MMMMMM, OOOOOO	No further action at this time – see MACT
1992	Alternative Control Technology Document – Bakery Ovens		No action at this time – not a CTG VOC source category
1992	Control Techniques for Volatile Organic Compound Emissions from Stationary Sources	NA – compilation of control techniques	
1992 (1994)	Industrial Wastewater Alternative Control Technology		No action at this time – not a CTG VOC source category
1993	Control of VOC Emissions from the Application of Agricultural Pesticides		No further action at this time – APCD does not regulate agriculture
1994	Alternative Control Techniques Document – Volatile Organic Liquid Storage in Floating and Fixed Roof Tanks	40 CFR Part 60 Subparts K, Kb	No further action at this time – see CTG, NSPS
1994	Control of Volatile Organic Compound Emissions from Batch Processes		No action at this time – not a CTG VOC source category
1994	Alternative Control Techniques Document – Industrial Cleaning Solvents		No further action at this time – see CTG
1994	Alternative Control Techniques Document – Surface Coating of Automotive/Transportation and Business Machine Plastic Parts	40 CFR Part 60 Subpart TTTT, 40 CFR Part 63 Subpart PPPP	No further action at this time – see CTG, NSPS, MACT
1988 (1994)	Alternative Control Techniques Document – Automobile Refinishing	National Volatile Organic Compound Emission Standards for Automobile Refinish Coatings	No further action at this time – see consumer products rule
1994	Alternative Control Techniques Document – Surface Coating Operations at Shipbuilding and Ship Repair Facilities	40 CFR Part 63 Subpart II	No further action at this time – see CTG, MACT
1993 (1994)	Control of Volatile Organic Compound Emissions from Offset Lithographic Printing		No further action at this time – see CTG

**Appendix 6-E – ACT NOx Source Category**

Date of ACT	Description	Other rules	Summary conclusion
1991	NOx Emissions from Nitric and Adipic Acid Manufacturing Plants	40 CFR Part 60 Subparts G, Ga	No further action at this time – see NSPS, MACT
1993	NOx Emissions from Stationary Combustion Turbines	R6.II (SO2) & 40 CFR Part 60 Subparts GG, KKKK, 40 CFR Part 63 Subpart YYYY	No further action at this time – see NSPS, MACT
1993	NOx Emissions from Process Heaters		No further action at this time – source by source RACT permitting analysis
1993 (2000)	NOx Emissions from Stationary Internal Combustion Engines	R7.XVI, XVII & 40 CFR Part 60 Subparts IIII, JJJJ	No further action at this time – see NSPS, MACT
1994 (2000)	NOx Emissions from Cement Manufacturing	R6.III (SO2) & 40 CFR Part 60 Subpart F, 40 CFR Part 63 Subpart LLL	No further action at this time – see NSPS, MACT
1994	NOx Emissions from Industrial, Commercial & Institutional Boilers	R6.II. (SO2), VIII (Hg) & 40 CFR Part 63 Subparts DDDD, JJJJJ	No further action at this time – see NSPS, MACT
1994	Alternative Control Techniques – NOx Emissions from Utility Boilers	R6.II.D (SO2), VIII (Hg) & 40 CFR Part 60 Subparts D, Da, Db, Dc, 40 CFR Part 63 Subpart UUUUU	No further action at this time – see NSPS, MACT
1994	Alternative Control Techniques – NOx Emissions from Glass Manufacturing	R6.III (SO2) & 40 CFR Part 60 Subpart CC, 40 CFR Part 63 Subpart SSSSSS	No further action at this time – see NSPS, MACT
1994	Alternative Control Techniques – NOx Emissions from Iron and Steel Mills	R6.III (SO2) & 40 CFR Part 60 Subpart AA, AAa, Na, 40 CFR Part 63 Subparts CCC, EEEEE, FFFFF, ZZZZZ	No further action at this time – see NSPS, MACT

Appendix 6-F – Major Sources of VOC and/or NOx Emissions in Colorado Ozone Nonattainment Area

Pollutant	Facility	AIRS ID	Facility purpose	Estimated emissions, uncon (tpy)	Estimated emissions, actual (tpy)	Major VOC or NOx emission points	Requirements	Summary conclusion
SIC: Petroleum Refining, Petroleum Bulk Stations/Terminals, Wood Kitchen Cabinets, Refuse Systems, Malt Beverages, Metal Cans, Photographic Equipment/Supplies, Soil Prep. Services								
VOC	SUNCOR ENERGY - DENVER REFINERY	001-0003	Petroleum refining	4840.14	421.59	Tanks, cold cleaners, wastewater treatment, rail and truck loading, equipment leaks	Tanks – MACT CC, NSPS Kb, R7.III, R7.VI, R7.IV, NSPS UU, MACT R; cold cleaners – R7.X; cooling towers – MACT CC; catalytic reforming – MACT UUU; wastewater treatment – MACT CC, NESHAP FF, NSPS Kb, NSPS QQQ; rail car loading – R7.VI; truck loading – NSPS XX, MACT GGGG, MACT R, R7.VI, groundwater treatment – R7.V; leaks – MACT CC, NSPS GGG, R7.VIII	No further action at this time
NOx	SUNCOR ENERGY - DENVER REFINERY	001-0003	Petroleum refining	576.932	526.92	Engines, heaters	Engines – MACT ZZZZ, NSPS IIII, NSPS JJJJ; process heater – MACT DDDDD, NSPS J, NSPS Ja; sulfur recovery unit – NSPS J, MACT UUU; fluid catalytic cracking unit – NSPS J, MACT UUU	Analyzing potential additional NOx controls
VOC	PHILLIPS PIPELINE - DENVER TERMINAL	001-0015	Petroleum marketing and storage terminal	1905.61	127.27	Tanks, loading rack, tank cleaning, equipment leaks	Tanks – VCU, NSPS XX, NSPS K, NSPS Kb, MACT BBBBBB; internal floating roof	No further action at this time
VOC	SINCLAIR PRODUCTS DENVER TERMINAL	001-0019	Petroleum products terminal	107.9	96.5	Tanks, truck and rail loading, fugitive emissions	Tanks – VCU (2), NSPS K, NSPS Ka, NSPS Kb, MACT BBBBBB, R7.III; truck loading – VCU, MACT BBBBBB; fugitive VOC – MACT BBBBBB	No further action at this time
VOC	ELKAY WOOD PRODUCTS COMPANY	001-1602	Manufactures wood cabinets using various woodworking equipment	166.9	166.9	Spray booths, wood working, coatings	Spray booths – PM filters; wood working areas – baghouse; coatings – MACT JJ VHAP limits; HVLP; fugitive VOC emission control	Analyzing potential additional VOC controls
VOC	WASTE MANAGEMENT OF COLORADO DEN ARAP DI	005-1291	Municipal solid waste disposal facility	4795.99	59.83	Landfill gas	Landfill gas – flare, NSPS Cc	No further action at this time
VOC	MILLERCOORS, LLC - GOLDEN BREWERY	059-0006	Produces malt beverages	1221.9	481.026	Grain handling, fermenting/brewing, bottling, wastewater	Fermenting – VOC duct (boilers); wastewater treatment plant – submerged fill; bottle label glue – pollution prevention, low VOC glue; tanks – no detectable vapor loss, fugitive emissions – R7.IX.A.7	Analyzing potential additional VOC controls
VOC	BALL BEVERAGE CONTAINER CORP	059-0010	Produces aluminum cans and ends	294.002	126.955	Boilers, cold solvent parts coating systems, conversion presses, end compound liners, storage	Cold cleaners – R7.X.; coating systems – RTO, NSPS WW, R7.IX.C.; printing lines – RTO; storage tanks – R7.III.	Analyzing potential additional VOC controls



Pollutant	Facility	AIRS ID	Facility purpose	Estimated emissions, uncon (tpy)	Estimated emissions, actual (tpy)	Major VOC or NOx emission points	Requirements	Summary conclusion
VOC	ANHEUSER-BUSCH, LLC	069-0060	Produces malt beverages	271.214	271.214	Brewing, bottle/can line, wastewater, ethanol loadout tanks	Brewing – efficient process operation; packaging – pollution prevention; alcohol distillation – ethanol recovery, submerged fill	Analyzing potential additional VOC and NOx controls
VOC	EASTMAN KODAK CO	123-0003	Manufacture photographic supplies	2146.97	45	Chemical manufacturing, thermal media manufacturing	Thermal media coating lines – RTO, MACT KK	No further action at this time
NOx	EASTMAN KODAK CO	123-0003	Manufacture photographic supplies	223	1.8	Boilers	Boilers – gas consumption limit	No further action at this time
VOC	METAL CONTAINER CORP	123-0134	Manufactures the bodies of 2 piece-aluminum beverage cans	245.31	245.31	Can coating, cleaning solvents	Can coating – NSPS WW, R7.IX.C.; fugitive emissions – R7.IX.A.7.; cleaning solvents – R7.X.	Analyzing potential additional VOC controls
VOC	NUTRI-TURF INC	123-0497	Land application of brewery wastewater	4240	106	Land application	Land application – evaporation, vegetative destruction	No further action at this time
VOC	STROMO, LLC - HUDSON COMPOSTING FACILITY	123-9AF1	Composting	256.3	256.3	Composting	Composting – best management practices (cover)	No further action at this time
VOC	A1 ORGANICS - RATTLER RIDGE ORG RECYCLING	123-9AEF	Composting	231.3	231.3	Composting	Composting – best management practices (cover)	No further action at this time
SIC: Electric Services, Cement, Glass Containers, Construction Sand and Gravel, Stream and Air-Conditioning Supply, Photographic Equipment and Supplies								
NOx	PUBLIC SERVICE CO CHEROKEE PLT <sup>3</sup>	001-0001	Electric generating facility	5338.34	5338.34	2 coal fired boilers, 3 emergency diesel generators	Boilers – LNB-OFA then shutdown or conversion to gas; 1 generator – NSPS III, MACT ZZZZ	No further action at this time
NOx	PUBLIC SERVICE CO - VALMONT <sup>3</sup>	013-0001	Electric generating facility	4088.24	2068.93	Coal fired boiler, gas fired boiler, gas fired turbine, oil fired turbine, emergency diesel generator	Coal boiler – low NOx burner and over-fire air then shutdown; gas boiler – low NOx burners, MACT DDDDD; generator – MACT ZZZZ	No further action at this time
NOx	CEMEX CONSTRUCTION MATERIALS LYONS <sup>3</sup>	013-0003	Manufacturers Portland cement	1050.82	1050.82	Raw material dryer, kiln	Dryer – operation as designed, MACT LLL; kiln – fuel consumption, MACT LLL	No further action at this time

Pollutant	Facility	AIRS ID	Facility purpose	Estimated emissions, uncon (tpy)	Estimated emissions, actual (tpy)	Major VOC or NOx emission points	Requirements	Summary conclusion
NOx	UNIV OF COLO BOULDER - POWER HOUSE	013-0553	Electricity and steam generation	158.52	95.62	2 gas/oil fired turbines, 2 standby gas/oil backup boilers	Turbines – fuel consumption, NSPS GG, steam injection	No further action at this time
NOx	PUBLIC SERVICE CO DENVER STEAM PLT	031-0041	Industrial steam boilers	181.87	181.87	2 primarily gas fired steam boilers	Boilers – fuel consumption	No further action at this time
NOx	ROCKY MOUNTAIN BOTTLE CO	059-0008	Produces container glass	351.75	351.75	3 glass melt furnaces	Furnaces – glass production limit	Analyzing potential additional controls NOx
NOx	TEXAS IND (TXI) OPERATIONS DBA WESTERN A	059-0409	Shale quarry	117.65	117.65	Rotary kiln, diesel emergency generator	Kiln – fuel usage, NSPS UUU; generator – MACT ZZZZ	Analyzing potential additional controls NOx
NOx	COLORADO-GOLDEN ENERGY CORPORATION <sup>18</sup>	059-0820	Electricity and steam generation	636.525	636.525	2 gas/oil fired boilers, coal fired boiler, 2 coal/gas/ethane fired boilers	Coal boiler – baghouse; coal/ethanol boilers – baghouse	Analyzing potential additional controls NOx
NOx	PLAINS END, LLC	059-0864	Electric generating facility	140.991	26.287	34 gas fired internal combustion engines, emergency engines	Engines – SCR, MACT ZZZZ or NSPS JJJ; emergency engine – MACT ZZZZ or NSPS IIII	No further action at this time
NOx	COLORADO STATE UNIV CSU FACILITY SVCS	069-0011	Electricity and steam generation	123.379	123.379	3 gas/oil fired boilers, steam turbine, 2 gas fired boilers, emergency generators	Boilers – fuel consumption; gas boilers –fuel consumption, NSPS Dc; generators – NSPS IIII or NSPS JJJJ	Analyzing potential additional controls NOx
NOx	PLATTE RIVER POWER AUTHORITY -RAWHIDE <sup>3</sup>	069-0053	Electric generating facility	4717.88	1419.87	Coal boiler, 5 gas fired simple cycle combustion turbines	Boiler - LNC3 low-NOx combustion control system with separated over-fire-air and a low NOx concentric firing burner; turbines – dry/low NOx combustion systems	No further action at this time
NOx	PUBLIC SERVICE CO FORT SAINT VRAIN PLT	123-0023	Electric generating facility	1237.94	391.34	5 gas combustion turbines, heat recovery steam generators, auxiliary boiler, diesel emergency generators	Turbines – dry low NOx burners; heat recovery generators – SCR; boiler – gas consumption limit; generator – MACT ZZZZ	No further action at this time
NOx	THERMO POWER & ELEC INC	123-0126	Cogeneration of electricity and steam	350	70	5 combustion turbines, 2 emergency engines	Turbines – steam injection, 1-3 retired; engines – MACT ZZZZ	Analyzing potential additional controls NOx
NOx	THERMO COGEN PARTNERSHIP - JM	123-0250	Cogeneration of electricity and steam	281.9723	281.9723	5 combustion turbines, 2 diesel emergency	Turbines – steam injection; engines – MACT ZZZZ	Analyzing potential additional controls NOx

<sup>18</sup> Subject to Regional Haze BART or Reasonable Progress determination, approved by EPA December 31, 2012 (77 Fed. Reg. 76871).

Pollutant	Facility	AIRS ID	Facility purpose	Estimated emissions, uncon (tpy)	Estimated emissions, actual (tpy)	Major VOC or NOx emission points	Requirements	Summary conclusion
	SHAFER		electricity and steam			engines		additional controls NOx
NOx	OWENS-BROCKWAY GLASS - TUMBLEWEED	123-4406	Glass container manufacturing facility	231.8662	231.8662	2 glass melting furnaces, diesel engine	Furnaces – glass production and NOx limit; engine – NSPS IIII	Analyzing potential additional controls NOx
NOx	SPINDLE HILL ENERGY, LLC	123-5468	Peaking utility electric power generation facility	118.69	118.69	2 combustion turbines, gas heater, diesel engine	Turbines – dry low NOx combustion system and water injection, NSPS KKKK; gas heater – NSPS Dc; diesel engine – MACT ZZZZ, NSPS IIII	No further action at this time
NOx	CARESTREAM HEALTH, INC	123-6350	Photographic supplies manufacturer	133	133	Boilers	Boilers fuel consumption limit	Analyzing potential additional controls NOx
SIC: Natural Gas Transmission, Crude Petroleum and Natural Gas, Natural Gas Liquids								
NOx	COLORADO INTERSTATE GAS CO - LATIGO C.S.	005-0055	Compressor station	174.87	174.87	5 gas fired engines, dehydration unit, process heater	Engines – fuel consumption, 4-R7.XVII.E.3. cost analysis; MACT ZZZZ; process heater – MACT DDDDD; fugitive emissions LDAR	Analyzing potential additional controls NOx
NOx	COLORADO INTERSTATE GAS CO WATKINS C.S.	001-0036	Compressor station	398.5	398.5	11 gas fired engines, process heaters	Engines – 6-R7.XVII.E.3. cost analysis; process heater – MACT DDDDD; fugitive emissions LDAR	Analyzing potential additional controls NOx
VOC	DCP MIDSTREAM LP - ENTERPRISE C.S.	123-0277	Compressor station	115.83	115.83	6 gas fired engines, 2 TEG dehydration units, 8 condensate storage tanks	Engines – oxidation catalyst, NSPS JJJJ, MACT ZZZZ; dehy – flare; tanks – enclosed combustor; fugitive emissions LDAR	No further action at this time
VOC	DCP MIDSTREAM, LP - GREELEY GAS PLANT	123-0099	Natural gas processing plant	295.21	83.55	Gas processing skid, storage tanks, TEG dehydration unit, EG dehydration unit, 8 engines, oil heaters	Skid and fractionation towers – NSPS KKK; tank and liquid loadout – VRU; engines – NSCR, fugitive emissions LDAR	No further action at this time
NOx	DCP MIDSTREAM, LP - MARLA C.S.	123-0243	Compressor station	500.51	88.7129	6 gas fired engines, 2 TEG dehydration units, fugitive VOC leaks	Engines – NSCR; dehy units – condenser and flare, fugitive emissions LDAR	No further action at this time
VOC	DCP MIDSTREAM, LP - PLATTEVILLE	123-0595	Natural gas processing plant	181.49	152.136	Gas processing skid, EG storage tanks, 9 engines, hot oil heater, fugitive VOC	Engines – NSCR, MACT ZZZZ, NSPS JJJJ; hot oil heater – gas consumption; dehy – vented back into process; fugitive emissions LDAR	No further action at this time
NOx	DCP MIDSTREAM, LP - ROGGEN NGPP	123-0049	Natural gas processing	2511.35	191.258	12 engines, 2 heaters, 3 cryogenic plant skids,	Engines – air/fuel ratio controller, catalyst; propane truck blowdown – flare; depropanizer	No further action at this time

Pollutant	Facility	AIRS ID	Facility purpose	Estimated emissions, uncon (tpy)	Estimated emissions, actual (tpy)	Major VOC or NOx emission points	Requirements	Summary conclusion
NOx		123-0049	plant	959.694	205.09	fractionator plant, condensate storage tanks	heater – fuel consumption; fugitive emissions LDAR	No further action at this time
VOC	DCP MIDSTREAM, LP - SPINDLE GAS PLANT	123-0015	Natural gas processing plant	361.758	134.397	12 engines, TEG dehydration unit, fugitive emissions; gas processing skid, hot oil heater, condensate loadout rack, 4 storage tanks	Fugitive emissions – NSPS KKK; engines – NSCR, oxidation catalyst, MACT ZZZZ; dehy – condenser reboiler/flare; hot oil heater – fuel consumption; fugitive emissions LDAR	No further action at this time
NOx		123-0015		284.292	284.292			
VOC	DCP MIDSTREAM, LP- LUCERNE	123-0107	Natural gas processing plant	157.981	84.7656	10 engines, regeneration boiler, fugitive emissions	Engines – NSCR; fugitive emissions LDAR	No further action at this time
NOx		123-0107		345.862	135.528			
VOC	DCP MIDSTREAM, LP- MEWBOWN	123-0090	Natural gas processing plant	961.08	110.197	15 engines, EG dehydration unit, hot oil heater, stabilized condensate truck loadout rack, 4 stabilized condensate storage tanks	Engines – NSCR, MACT ZZZZ, NSPS JJJJ; hot oil heater – NSPS Dc; fugitive emissions LDAR	No further action at this time
NOx		123-0090		267.764	90.1387			
VOC	KERR-MCGEE GATHERING - FREDERICK CS	123-0184	Compressor station	652.648	88.9771	3 engines, TEG dehydration unit, storage tanks, fugitive VOC	Dehy – thermal oxidizer unit; tanks – flare; 1 engine – oxidizing catalyst, MACT ZZZZ; fugitive emissions LDAR	No further action at this time
NOx		123-0184		220.921	109.461			
VOC	KERR-MCGEE Hudson Station	123-0048	Compressor station	471.5	84.8216	7 engines, 2 TEG dehydration units, condensate storage tank battery, fugitive VOC	3 engines – NSCR; dehy – flare; tanks – flare; fugitive emissions LDAR	No further action at this time
NOx		123-0048		273.205	273.205			
VOC	KMC GEE LUPTON/PLATTE VALLEY/LANCASTER	123-0057	Compressor station	2109.48	232.654	7 engines, TEG dehydration unit, fugitive VOC	3 engines – NSCR; fugitive emissions LDAR	No further action at this time
NOx		123-0057		281.997	281.997			
VOC	WGR HOLDING CO - WATTENBERG PLANT	001-0025	Natural gas processing plant	165.949	157.289	5 engines, hot oil heater, regeneration heaters, gas turbine, loadout, fugitive VOC, storage vessel	Engines – oxidation catalyst, R7.XVII.E.3. cost analysis; hot oil and regeneration heaters and steam boiler – fuel consumption; turbine – fuel consumption, NSPS GG; loadout to leak tight trucks; fugitive emissions LDAR; dehy – thermal oxidizer; tanks – MACT HH	No further action at this time
NOx		001-0025		691.487	691.487			

Pollutant	Facility	AIRS ID	Facility purpose	Estimated emissions, uncon (tpy)	Estimated emissions, actual (tpy)	Major VOC or NOx emission points	Requirements	Summary conclusion
NOx	COLORADO INTERSTATE GAS CO CHEYENNE STN	123-0051	Compressor station	146.289	146.289	11 engines	Engines – oxidation catalyst, R7.XVII.E.3. cost analysis; turbine – dry low NOx combustion system, MACT ZZZZ, fugitive emissions LDAR	No further action at this time
NOx	SOUTHERN STAR CENTRAL GAS PIPELINE CHEYE	123-0078	Compressor station	201.2	201.2	Engine, emergency generator	Engines – MACT ZZZZ, R7.XVII.E.3. cost analysis; fugitive emissions LDAR	No further action at this time