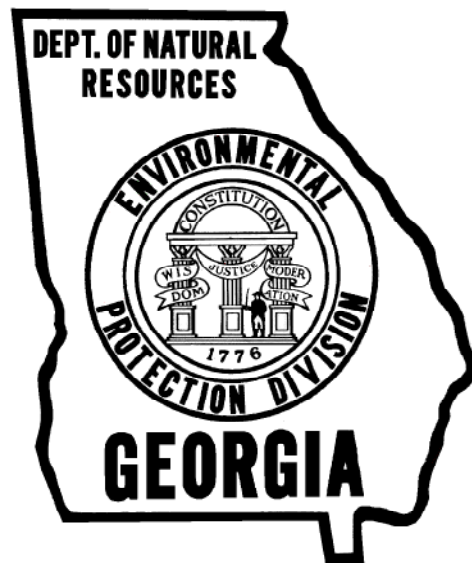


**Clean Air Act Section 110(l) Noninterference
Demonstration for the Relaxation of
Summertime Reid Vapor Pressure
Requirements in the Former 13-County
Atlanta Designated Volatility Nonattainment
Area**

August 15, 2018



Prepared by:

**Georgia Department of Natural Resources
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CAA Section 110(l) Noninterference Demonstration for the Relaxation of Summertime Reid Vapor Pressure Requirements

Executive Summary

This document contains Georgia's demonstration of noninterference and its request to relax the Federal summertime Reid Vapor Pressure (RVP) gasoline requirement in the Federal gasoline volatility rule at 40 CFR 80.27(a)(2) as it pertains to Georgia.

RVP is defined as the measure of gasoline volatility and impacts both VOC and NO_x emissions. Gasoline sold in the original 13-county 1-hour ozone nonattainment area (Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale) has an RVP requirement of 7.8 pounds per square inch (psi) from June 1 - September 15. Nonattainment areas with restricted RVP are also known as designated volatility nonattainment areas.

In this document the Georgia Environmental Protection Division (EPD) is requesting that the Environmental Protection Agency (EPA) relax the RVP requirements in the 13-county designated volatility area from 7.8 psi to 9.0 psi to match the RVP requirements that apply to the rest of Georgia year-round. This document also contains Georgia EPD's demonstration that relaxing the RVP to 9.0 psi will not interfere with the maintenance or attainment of the National Ambient Air Quality Standards (NAAQS) or with reasonable further progress toward attainment. This state implementation plan (SIP) submittal focuses on ozone, the national ambient air quality standard most likely to be impacted by the relaxation of the RVP. The relaxation of the RVP requirements will not interfere with the maintenance of the 1997 and 2008 8-hour ozone NAAQS or the attainment of the 2015 8-hour ozone NAAQS. Although the Atlanta area has been designated nonattainment for the 2015 ozone standard, this plan secures an equivalent emissions reduction; therefore, this change will not hinder Georgia's ability to attain the standard.

As part of this request, Georgia EPD is submitting a revised 2008 8-hour ozone maintenance plan with a supporting 110(l) demonstration. As a part of this SIP revision, the 2008 8-hour ozone maintenance plan has been revised with an updated emissions inventory for the on-road and non-road sectors, and updated motor vehicle emissions budgets (MVEB) and safety margins. The 110(l) demonstration secures reproducible, enforceable, surplus, quantifiable, and permanent offsets so that the relaxation of RVP from 7.8 to 9.0 psi will not interfere with continued maintenance of the 2008 8-hour ozone standard.

Georgia is currently in attainment for particulate matter (PM), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), and lead (Pb). The relaxation of the RVP will have little to no impact on emissions of these pollutants or their related precursors. There is no concern that the relaxation of the RVP will interfere with compliance with the NAAQS in these attainment areas. Georgia EPD demonstrates in this SIP revision that this revision to Georgia's SIP is consistent with section 110(l) of the Clean Air Act and will not interfere with the corresponding attainment and maintenance of the NAAQS.

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LIST of ACRONYMS

Acronym	Meaning
ARC	Atlanta Regional Commission
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CFR	Code of Federal Regulations
CMAQ	Community Multi-scale Air Quality
CO	Carbon monoxide
E10	Gasoline containing 9-10% ethanol
EPA	Environmental Protection Agency
EPD	Environmental Protection Division
FR	Federal Register
MOVES	Motor Vehicle Emissions Simulator
MVEB	Motor Vehicle Emissions Budget
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
NPRM	Notice of Proposed Rulemaking
Pb	Lead
PM	Particulate matter
PM ₁₀	Particulate matter with an aerodynamic diameter less than 10 micrometers
PM _{2.5}	Particulate matter with an aerodynamic diameter less than 2.5 micrometers
ppb	Parts per billion
ppm	Parts per million
PSI	Pounds per square inch
RFP	Reasonable further progress
RVP	Reid Vapor Pressure
SEMAP	Southeastern Modeling Analysis and Planning
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
TPD	Tons per day
VOC	Volatile organic compounds

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1.0 Introduction and Background

The Georgia Environmental Protection Division (EPD) requests to modify the Federal gasoline volatility rule, 40 CFR 80.27(a)(2), *Controls and prohibitions on gasoline volatility: Prohibited activities in 1992 and beyond* by relaxing the Reid Vapor Pressure (RVP) gasoline requirement of 7.8 pounds per square inch (psi) to 9.0 psi for the 13-county designated volatility nonattainment area. This request includes a technical analysis demonstrating that the relaxation of the RVP requirement will not interfere with the attainment or maintenance of any National Ambient Air Quality Standards (NAAQS) or any other CAA requirement as prescribed in section 110(l) of the Clean Air Act (CAA).

The noninterference demonstration contained in this document focuses on the impact of the relaxation of the RVP requirement in 13 Atlanta area counties (Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale) that were part of the 1979 1-hour ozone nonattainment area (NAA). As part of the RVP relaxation request from 7.8 psi to 9.0 psi, Georgia EPD is revising its 2008 8-hour ozone maintenance plan with a supporting 110(l) demonstration. The *Atlanta Area 2008 8-Hour Ozone Maintenance Plan and Redesignation Request* has been revised with an updated emissions inventory for on-road and non-road sectors, and updated motor vehicle emissions budgets (MVEB) and safety margins. This is demonstrated by securing reproducible, enforceable, surplus, quantifiable, and permanent offsets so that the relaxation of RVP from 7.8 to 9.0 psi will not interfere with continued maintenance of the 1997 and 2008 8-hour ozone standard or attainment of the 2015 8-hour ozone NAAQS. For the 2015 ozone standard, a 7-county Atlanta area has been designated nonattainment. This plan secures an equivalent emissions reduction and therefore, relaxation of the RVP requirement will not hinder Georgia's ability to attain the standard. Furthermore, relaxing the RVP requirement will not interfere with the attainment or maintenance of particulate matter (PM), which includes particulate matter with an aerodynamic diameter less than 10 micrometers and 2.5 micrometers (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), or lead (Pb) NAAQS. There are no nonattainment or maintenance areas in Georgia for PM, SO₂, NO₂, CO, or Pb. All of the PM, SO₂, NO₂, CO, and Pb monitors in the affected area are currently measuring levels well below the NAAQS and these revisions will result in little or no increase in emissions of these pollutants or their precursors.

The Federal requirement of an RVP of 7.8 psi or less during the high ozone season (June 1 - September 15), was promulgated to reduce emissions contributing to nonattainment of the 1979 1-hour ozone NAAQS across the country. Over time, EPA has tightened the ozone NAAQS. The Atlanta region has historically reached attainment for the previous standard around the same time it was designated nonattainment for the new standard. This section will review the history of ozone NAAQS designations in the Atlanta region, the history of RVP, the RVP requirements in Georgia, and the regulatory requirements for the noninterference demonstration.

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Section 1.1 through 1.3 will give the history of Atlanta's Nonattainment Area (Section 1.1), the history of the development of the RVP regulations (Section 1.2), and an explanation of how the nonattainment status of the Atlanta area and the RVP regulations intersect (Section 1.3). Section 1.4 will request the relaxation of the RVP requirements in Federal gas volatility rule 40 CFR 80.27(a)(2).

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Table 1-1. Atlanta Ozone NAAQS Designations.

NAAQS Designation Year	Averaging Time; Form	Level (ppm)	Attainment Classification (Federal Register (FR) citation, FR date)	Nonattainment Area	Attainment Date (FR citation, FR date)
1979	1-hour Number of days per calendar year, with maximum hourly average concentration greater than 0.12 ppm, is equal to or less than 1	0.12	Serious (56 FR 56694, November 6, 1991)	Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale	Met attainment deadline of November 15, 2005 (70 FR 34660, June 15, 2005)
			Severe (68 FR 55469, September 26, 2003)		
1997	8-hour Annual 4th-highest daily maximum 8-hr average concentration, averaged over 3 years	0.08	Marginal (69 FR 23858, April 30, 2004)	Barrow, Bartow, Carroll, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Henry, Newton, Paulding, Rockdale, Spalding, and Walton	Met attainment deadline of June 15, 2011 (78 FR 72040, December 2, 2013)
			Moderate (73 FR 12013, March 6, 2008)		
			Moderate (75 FR 73969, November 30, 2010) Granted one year extension		
2008	8-hour Annual 4th-highest daily maximum 8-hr average concentration, averaged over 3 years	0.075	Marginal (77 FR 30088, May 21, 2012)	Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Newton, Paulding, and Rockdale	Met attainment deadline of July 20, 2018 (82 FR 25523, June 2, 2017)
			Moderate (81 FR 26697, May 4, 2016)		
2015	8-hour Annual 4th-highest daily maximum 8-hr average concentration, averaged over 3 years	0.070	Marginal (83 FR 25776, June 4, 2018)	Bartow, Clayton, Cobb, DeKalb, Fulton, Gwinnett, and Henry	N/A

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1.1 The Atlanta Nonattainment/Maintenance Area

This section provides a brief overview of the Atlanta area ozone nonattainment history. Table 1-1 summarizes the designation, classification, and attainment history of each ozone NAAQS for the Atlanta region. Each subsection following Table 1-1 will discuss specifics to individual standards and their current status.

1.1.1 1979 1-Hour Ozone Standard

Pursuant to the Clean Air Act Amendments of 1990 (CAAA), the Atlanta area was designated as serious nonattainment for the 1979 1-hour ozone NAAQS (0.12 parts per million (ppm)) by U.S. EPA on November 6, 1991. The area was comprised of 13 Georgia counties (Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale). When Atlanta failed to attain the 1-hour ozone NAAQS by the attainment deadline (November 15, 1999), EPA issued a final rulemaking on September 26, 2003 that the Atlanta area was being reclassified as a "severe" ozone nonattainment area effective January 1, 2004 (68 FR 55469). On June 15, 2005, EPA approved Georgia EPD's request to redesignate the Atlanta area from nonattainment to attainment with respect to the 1-hour ozone NAAQS (70 FR 34660).

1.1.2 1997 8-Hour Ozone Standard

Under the 1997 8-hour ozone standard (0.08 ppm), EPA designated 20 Atlanta counties on April 30, 2004 as a "marginal" nonattainment area. The 8-hour ozone nonattainment area encompassed the 13-counties (Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale) from the former 1-hour ozone nonattainment area plus seven (Barrow, Bartow, Carroll, Hall, Newton, Spalding, and Walton) additional "ring" counties. On March 6, 2008, EPA determined that the Atlanta Area did not attain the 1997 8-hour ozone NAAQS by June 15, 2007, as required, and reclassified the area to "moderate" nonattainment (73 FR 12013).

Georgia EPD submitted a request for a one-year extension of the attainment date in accordance with 40 CFR 51.907 on June 9, 2010, and EPA published a final rule granting that extension on November 30, 2010 (75 FR 73969). On June 23, 2011, EPA promulgated its determination (76 FR 36873) that the Atlanta nonattainment area had attaining data to meet the 1997 8-hour ozone NAAQS. EPA published a final rule confirming that the Atlanta nonattainment area had attained the 1997 8-hour ozone NAAQS by its applicable attainment date on March 7, 2012 (77 FR 13491).

In order to be formally redesignated attainment, Georgia EPD was required to submit a maintenance plan. On April 4, 2012, Georgia EPD submitted a maintenance plan under the CAAA of 1990 requesting that the Atlanta area be redesignated from nonattainment to attainment based on 2008-2010 ambient monitoring data. EPA approved the plan and

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redesignation request and promulgated a proposed rule on February 4, 2013 (78 FR 7705), that was published in the Federal Register as a final rule on December 2, 2013 (78 FR 72040). The relaxation of the RVP requirements will not interfere with the maintenance of the 1997 8-hour ozone NAAQS.

1.1.3 2008 8-Hour Ozone Standard

On May 21, 2012 (77 FR 30088), EPA published a final rule in the Federal Register designating a new 15-county (Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Newton, Paulding, and Rockdale) Atlanta area as “marginal” nonattainment for the 2008 8-hour ozone NAAQS (0.075 ppm). The Atlanta area was reclassified as “moderate,” on May 4, 2016 (81 FR 26697). On July 14, 2016, the Atlanta area attained the 2008 standard and EPA issued a clean data determination (81 FR 45419). EPD subsequently requested that EPA redesignate the Atlanta Area to attainment for the 2008 8-hour ozone NAAQS and submitted a maintenance plan for the 2008 8-hour Atlanta nonattainment area (2008 Ozone NAAQS Maintenance Plan). In a notice of proposed rulemaking (NPRM) published on December 23, 2016 (81 FR 94283), EPA proposed to approve the maintenance plan, including the 2014 and 2030 Motor Vehicle Emissions Budgets (MVEBs) for nitrogen oxides (NO_x) and volatile organic compounds (VOCs), and to re-designate the area to attainment for the 2008 8-hour ozone NAAQS. Final redesignation to maintenance was approved on June 2, 2017 (82 FR 25523). The relaxation of the RVP requirements will not interfere with the maintenance of the 2008 8-hour ozone NAAQS.

1.1.4 2015 8-Hour Ozone Standard

On October 1, 2015 EPA announced its decision to lower the 8-hour ozone standard from 0.075 ppm to 0.070 ppm. The new standard became effective December 28, 2015 (80 FR 65292). On September 23, 2016, EPD recommended¹ an 8-county (Bartow, Clayton, Cobb, DeKalb, Fulton, Gwinnett, Henry and Rockdale) nonattainment area for the 2015 ozone NAAQS. This recommendation was based on 2013-2015 certified data. On December 20, 2017, EPD received a 120-day letter from EPA matching EPD’s recommendation and allowing EPD to provide additional input regarding designations if 2015-2017 data was early certified. On February 9, 2018, EPD recommended that Rockdale County be designated attainment based on the 2015-2017 monitoring data, leaving a 7-county area. EPA designated 7 counties (Bartow, Clayton, Cobb, DeKalb, Fulton, Gwinnett, and Henry) as nonattainment for the 2015 ozone NAAQS on April 30, 2018² (83 FR 25776). The

¹Georgia EPD 2015 Ozone NAAQS Designation Recommendation Letter: <https://www.epa.gov/sites/production/files/2016-11/documents/ga-rec.pdf>

²Letter from EPA Administrator Scott Pruitt to Governor Nathan Deal on April 30, 2018.

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relaxation of the RVP requirements will not interfere with the attainment of the 2015 8-hour ozone NAAQS.

1.2 Reid Vapor Pressure

Reid Vapor Pressure (RVP) is a common measure of gasoline volatility and the generic term used to identify and regulate gasoline volatility. This section will review RVP in relation to the Clean Air Act and the varying requirements due to ozone NAAQS designations over time.

1.2.1 RVP and the Clean Air Act

Title II of the CAA defines provisions for emissions from mobile sources that are addressed by EPA on a national level. Specifically, sections 202 – 219 (Part A of Title II) apply to Motor Vehicle Emissions and Fuel Standards. EPA has determined that gasoline used by vehicles and equipment contributes to significant evaporative emissions.

In November of 1985, based on its findings that gasoline-fueled motor vehicles of the time were exceeding evaporative hydrocarbon standards, EPA published a report of “various strategies designed to reduce [the] evaporative excess via in-use fuel volatility controls and/or modifications to certification fuel volatility specifications and test procedure.”³ This report prompted an updated study titled *Draft Regulatory Impact Analysis: Control of Gasoline Volatility and Evaporative Hydrocarbon Emissions from New Motor Vehicles* which served as the technical basis for an NPRM on August 19, 1987 requiring refiners to reduce the volatility of their summertime gasoline in order to reduce evaporative emissions and subsequently reduce ozone concentrations (52 FR 31274).

On March 22, 1989, under the authority provided by section 211(c), EPA promulgated regulations that set maximum limits for the RVP of gasoline sold during the high ozone season (54 FR 11868). These regulations, effective in summer 1989, constituted Phase I of a two-phase nationwide program where commercial gasoline RVP had to be 10.5 psi, 9.5 psi, or 9.0 psi depending on location and month.

Phase II of the volatility control program was promulgated on June 11, 1990 (55 FR 23658). In this phase, EPA promulgated more stringent volatility controls by requiring maximum RVP standards of 9.0 psi for attainment areas or 7.8 psi for nonattainment areas during high ozone season. EPA assigned these fuel standards to each state depending on the month, climate-based factors, and the area’s initial ozone attainment designation with respect to the 1979 1-hour ozone NAAQS.

³“Study of Gasoline Volatility and Hydrocarbon Emissions from Motor Vehicles,” EPA-AA-SDSB-85-5

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With the passage of 1990 CAA Amendments on November 15, 1990, fuel volatility was addressed under the new section 211(h). Section 211(h) requires EPA to promulgate regulations making it unlawful to sell, offer for sale, dispense, supply, offer for supply, transport, or introduce into commerce gasoline with an RVP level in excess of 9.0 psi during the high ozone season. Furthermore, section 211(h) prohibits EPA from establishing a more stringent volatility standard than 9.0 psi in an ozone attainment area, but may do so in areas of former ozone nonattainment that have been redesignated to attainment. The volatility regulations can be found at 40 CFR 80.27. The RVP standard was set at 9.0 psi for designated volatility attainment areas (40 CFR 80.27(a)(2)(i)) and the RVP standard was set to 7.8 psi for certain designated volatility nonattainment areas (40 CFR 80.27(a)(2)(ii)).

On December 12, 1991, EPA modified the Phase II volatility regulations to be consistent with section 211(h) of the CAA (56 FR 64704). The modified regulations prohibited the sale of gasoline with an RVP above 9.0 psi in all areas designated attainment for ozone, beginning in 1992. For areas designated as nonattainment, the regulations retained the original Phase II standards published on June 11, 1990 (55 FR 23658). A current listing of the RVP requirements for states can be found on EPA's Web site at: <https://www.epa.gov/gasoline-standards>.

1.2.2 RVP and 1979 1-Hour Ozone Standard

Under the initial 1-hour ozone serious (and briefly severe) nonattainment designation, the 13-county Atlanta area needed to lower the RVP for commercially sold gasoline in addition to other requirements to meet the NAAQS. To comply, Georgia adopted a state fuel program through Georgia Rule 391-3-1-.02(2)(bbb), *Gasoline Marketing*, which required the sale of low sulfur gasoline with an RVP of 7.0 psi during the high ozone season in a 45-county Georgia Fuel Area.⁴ The Georgia Fuel Area included the 20-county 1997 8-hour ozone maintenance and the 15-county 2008 8-hour nonattainment areas (15-county being a subset of the 20-county area) with the remaining counties considered "counties of influence". This Georgia Rule was implemented through a waiver under section 211(c)(4)(C) of the CAA which allowed the adoption of a state fuel program more stringent than the Federal requirement. EPA incorporated the *Gasoline Marketing* Rule into the Georgia State Implementation Plan (SIP) on July 19, 2004 (69 FR 33862).

⁴The Georgia Fuel Area consists of the following 45 Georgia counties: Banks, Barrow, Bartow, Butts, Carroll, Chattooga, Cherokee, Clarke, Clayton, Cobb, Coweta, Dawson, DeKalb, Douglas, Fayette, Floyd, Forsyth, Fulton, Gordon, Gwinnett, Hall, Haralson, Heard, Henry, Jackson, Jasper, Jones, Lamar, Lumpkin, Madison, Meriwether, Monroe, Morgan, Newton, Oconee, Paulding, Pickens, Pike, Polk, Putnam, Rockdale, Spalding, Troup, Walton and Upson.

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On February 5, 2015, EPD submitted a SIP revision to modify the Georgia SIP by removing Georgia Rule 391-3-1-.02(2)(bbb), *Gasoline Marketing*. The SIP revision included emissions offsets for the emissions increases that would be expected by the rule removal. A technical evaluation was conducted to demonstrate that there would be no interference with the nonattainment and maintenance areas of any of the relevant NAAQS due to restoring the RVP standard from 7.0 psi to the Federal standard of 7.8 psi for the 13 counties that comprised the original 1979 1-hour ozone NAAQS nonattainment area, and 9.0 psi for the remainder of the 45 county area. The SIP revision became effective on October 1, 2015 (80 FR 52627, September 1, 2015).

1.2.3 RVP Allowance of 1.0 psi

Adding ethanol to gasoline aids in oxygenation and carbon monoxide reduction. At 10% ethanol, the volatility of gasoline reaches a relative peak. Thus, Phase I of the RVP control program of 1989 had allowed a temporary 1.0 psi RVP allowance for gasoline containing 9% to 10% ethanol (E10) in order to maintain the air pollution reductions. In Phase II, the June 1990 regulations made the allowance permanent. In November 1990, Congress amended the CAA by adding section 211(h)(4) that provides a 1.0 psi waiver for gasoline that contains 10 percent ethanol. This waiver is incorporated in 40 CFR 80.27(d), *Special provisions for alcohol blends*. For the purposes of this document and modeling included in Section 2.0, the RVP standards that 40 CFR 80.27(a)(2) allows are essentially 8.8 psi for nonattainment areas and 10.0 psi for attainment areas when incorporating the 1.0 psi waiver for E10.

1.3 Clean Air Act Provisions

In order to support Georgia's request to relax the Federal RVP requirement of the Atlanta area, Georgia EPD must demonstrate that the change will satisfy section 110(l) of the CAA. Therefore, this section consists of a detailed description of those requirements.

1.3.1 Section 110(l) Requirement

Section 110(l) of the CAA, governs EPA's ability to approve all SIP revisions. Specifically, section 110(l) states:

Each revision to an implementation plan submitted by a State under this chapter shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171 of this title), or any other applicable requirement of this chapter.

The relaxation of the Federal RVP requirement in itself is not revising the SIP; however, it has the potential to impact attainment and reasonable further progress of the maintenance and future attainment of the Atlanta area or any other requirement of the Clean Air Act.

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The relaxation of the RVP requirement will result in a two-step approval process. EPA will first need to approve the 110(l) noninterference demonstration and subsequently follow up with an approval of the request to amend the Federal gasoline volatility rule at 40 CFR 80.27(a)(2).

1.3.2 Attainment and Maintenance

Designations for the 1997 8-hour ozone standard were assigned on April 30, 2004 to the Atlanta 20-county area (69 FR 23858), but applicable requirements of the 1979 1-hour ozone had to be followed until attainment was reached for the 13-county 1979 1-hour ozone NAA. The Atlanta area 1-hour ozone standard was attained and revoked effective June 15, 2005 (40 CFR 81.311) (70 FR 44470, August 3, 2005). Attainment for the 1997 8-hour ozone NAAQS was reached on June 23, 2011. Along with redesignation to attainment, Atlanta's maintenance plan for the 1997 8-hour ozone NAAQS was officially approved in December 2013. The 2008 8-hour Atlanta nonattainment area was officially redesignated attainment in June 2017, with the 2008 maintenance plan set in place. As mentioned in Section 1.1.4, designations for the 2015 8-hour ozone standard were completed on April 30, 2018.

1.4 Relaxation Request

With the submission of this plan revision, Georgia EPD is requesting the relaxation of the RVP requirements in Federal gas volatility rule 40 CFR 80.27(a)(2). This document was prepared using the requirements of 110(l), which demonstrate this revision will not interfere with attainment and reasonable further progress, as a basis for the relaxation of these rules.

The analysis contained in this document will focus on the impact of the relaxation of the Federal gas volatility rule on ozone maintenance and nonattainment areas within the geographic area covered by the rule, specifically maintenance of the 1997 and 2008 ozone standard and attainment of the 2015 ozone standard. Although, the Atlanta area has been designated nonattainment for the 2015 ozone standard, this plan secures an equivalent emissions reduction and therefore, this change will not hinder Georgia's ability to attain the standard.

Furthermore, these revisions will not interfere with attainment or maintenance of PM, SO₂, NO₂, CO, or Pb NAAQS and this revision to the Federal gas volatility rule will have little to no impact on emissions of the criteria air pollutants or their related precursors. There is no concern that the relaxation of RVP requirements will interfere with compliance with the NAAQS in their corresponding attainment areas. Since each of the monitors in the affected area is currently measuring levels well below the NAAQS, Georgia EPD can demonstrate in this SIP submittal that the relaxation to the Federal gasoline volatility rule is consistent with

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section 110(l) of the Clean Air Act and will not interfere with the maintenance of these standards or attainment of the 2015 ozone standard.

The 110(l) demonstration will be included in Section 2.0 and will cover the following:

- NO_x and VOC Emissions Analysis
- Emissions Compared to MVEBs
- Attainment/Maintenance Inventory Comparison
- NO_x and VOC Sensitivity

To demonstrate that maintaining attainment of the 2008 ozone NAAQS is not interfered with by relaxing the RVP, the NO_x and VOC emissions analysis will evaluate the impact of this relaxation of the 13-county requirement on the overall 15-county maintenance area. By estimating NO_x and VOC emissions, first with 7.8 psi (with a 1.0 psi waiver for E10) requirements for gasoline in place and then estimating those same pollutants with 9.0 psi (with a 1.0 psi waiver for E10) in place, EPD can show the impact of relaxing the RVP requirement on NO_x and VOC emissions. The MVEB emissions comparison will demonstrate that the relaxation of RVP does not require any changes to the MVEBs, nor interfere with transportation planning and the Atlanta Regional Commission's (ARC's) ability to continue to demonstrate conformity with SIP budgets. The maintenance plan which assumed RVP requirements of 7.8 psi (with a 1.0 psi waiver for E10) for the 13-county area will be compared with the emissions that result from the relaxation of RVP requirements to 9.0 psi (with a 1.0 psi waiver for E10). Emissions from the RVP relaxation must remain below those in the attainment/maintenance inventory and MVEBs.

Additional evidence that the relaxation of the RVP threshold will not interfere with the requirements of 110(l) can be found in Section 3 of this document. The state of Georgia is a NO_x limited area and Section 3 describes the sensitivity of ozone formation in the Atlanta area to reductions of NO_x and VOC emissions. The sensitivity analysis in Section 3 is based on photochemical grid modeling performed by Georgia Tech as part of the Southeastern Modeling, Analysis, and Planning (SEMAP) project.

When a state's 110(l) demonstration indicates that VOC or NO_x emissions have increased due to the relaxation or removal of a rule or a program in a nonattainment area, emissions offsets may be considered as long as the offset is reproducible, enforceable, surplus, quantifiable, and a permanent measure. Section 4 demonstrates secured emissions offsets to ensure that the relaxation of the RVP from 7.8 psi to 9.0 psi will not interfere with maintenance of the 1997 and 2008 8-hour ozone NAAQS or attainment of the 2015 8-hour ozone NAAQS. By covering the projected increases in VOC and NO_x emissions, the emissions offsets will ensure that the relaxation of the RVP will not interfere with the attainment of the Atlanta 2015 ozone nonattainment area.

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2.0 Federal gasoline volatility rule at 40 CFR 80.27(a)(2)

Conventional gasoline used in designated volatility attainment areas is restricted to an RVP of 9.0 psi (with a 1.0 psi waiver for E10) from June 1 to September 15. Gasoline used in designated volatility nonattainment areas is restricted to an RVP of 7.8 psi (with a 1.0 psi waiver for E10) from June 1 to September 15. For the 13 Atlanta counties in the designated volatility nonattainment area, we will refer to the current gasoline with an RVP of 7.8 psi (with a 1.0 psi waiver for E10) from June 1 to September 15 as “current RVP gasoline” and refer to and gasoline under a relaxed RVP requirement with an RVP of 9.0 psi (with a 1.0 psi waiver for E10) from June 1 to September 15 as “relaxed RVP gasoline”.

By estimating NO_x and VOC emissions, first with 40 CFR 80.27(a)(2) in place for the high ozone season (current RVP gasoline) and then estimating those same pollutants with the relaxed RVP threshold in place (relaxed RVP gasoline) for the 13-county area, Georgia EPD can quantify the impact of RVP relaxation on NO_x and VOC emissions. In this demonstration, increases in emissions for all 13 counties will be offset. Then, to further demonstrate that maintaining attainment of the 2008 ozone NAAQS is also not interfered with by switching from current RVP gasoline to relaxed RVP gasoline for the whole 15-county nonattainment area, an analysis is conducted with relaxation to evaluate the impact of this switch for the 13-county area, on the overall 15-county ozone maintenance area for VOC and NO_x in terms of comparisons with 2008 pollutant inventory levels and MVEBs. Emission impacts for both VOC and NO_x from RVP relaxation in the 15-county area are shown to be minimal each year, and decrease over time. Emissions are still well below 2014 attainment inventory levels and MVEBs. Additional details of the modeling and analysis associated with these scenarios can be found in Appendix A.

2.1 Impact of Relaxing the RVP requirements – Emissions Increase and Trends

2.1.1 NO_x Emissions Analysis

NO_x and VOC emissions were analyzed using Motor Vehicle Emissions Simulator (MOVES) 2014a to show the change in mobile emissions from the relaxation of the Federal summer RVP requirement for the former 13-county Atlanta nonattainment area. Modeling assumptions, inputs, and files are found in Appendix A. Emissions increases from this relaxation are minimal, and continue to decrease into the future. Figure 2-1 shows the annual trend for NO_x emissions increases.

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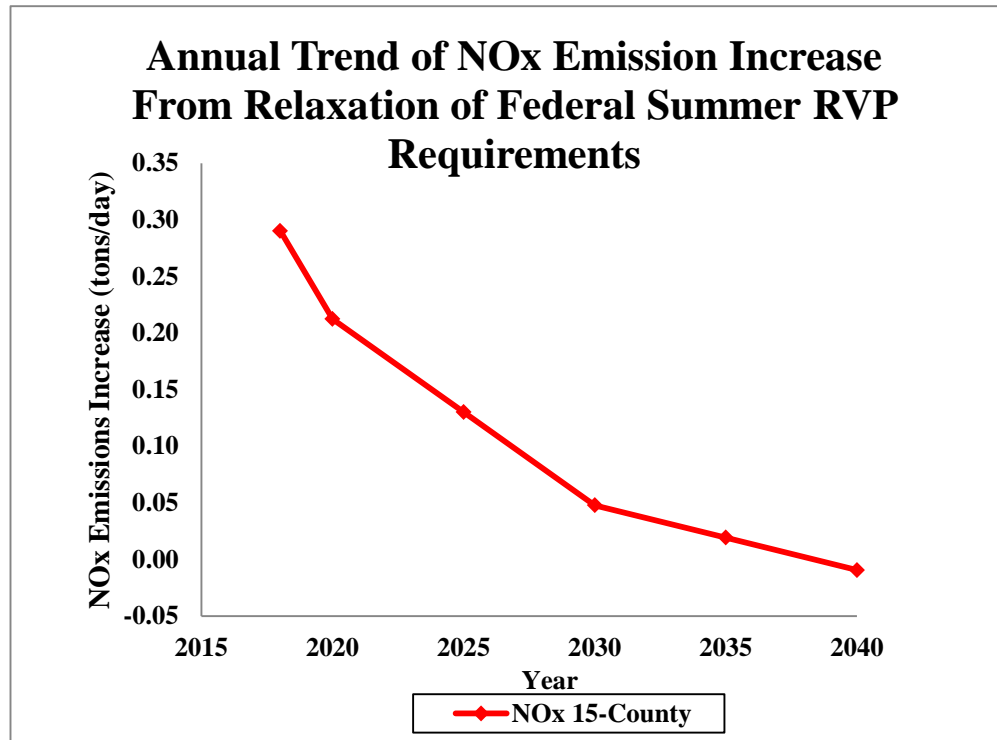


Figure 2-1: Annual Trend of NO_x Emissions Increase from Relaxation of the Federal Summer RVP Requirements.

The impact of relaxing the Federal summer RVP requirement in the 13-county Atlanta area, a subset of the 15-county 2008 8-hour ozone nonattainment area, is that any NO_x emissions increase, when comparing emissions in a given year, associated with the switch decreases steadily from 0.29 tons/day in 2018 to near zero by 2040. According to EPA’s MOVES model, non-road sources have no impact on NO_x with RVP change and thus only the on-road emissions source analysis is shown.

Table 2-1 compares the NO_x emissions with and without relaxation of the stricter RVP requirement for the 13-, 2-, and 15-county Atlanta areas and over a variety of years. As can be seen in the table, the 2-county area emissions are unaffected by the relaxation because this area has always had a more relaxed RVP requirement. However, the 13- and 2-county areas make up the 15-county ozone maintenance area so it is necessary to illustrate the impact for the whole nonattainment area and how it is broken down into areas that initially did or did not need to adhere to the stricter RVP requirement. Also, this data demonstrates, through continued decreases in on-road emissions over time for both RVP cases for all years and locations, how transportation conformity is maintained. The year 2014 is used as the first year of the analysis as it is both a base year and MVEB year for the Georgia maintenance SIP for the 2008 ozone NAAQS. The 2014 emissions values are pulled from the maintenance SIP. 2018 is the first year where new emissions estimates and impacts are calculated. Additional years include those used in ARC’s transportation conformity determination reports (2020, 2030, and 2040) and the other MVEB year (2030) in the 2008

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Ozone NAAQS Maintenance Plan. Additional modeling details can be found in Appendix A. For further illustration of impacts over time, 2025 and 2035 years were interpolated and added to the analysis. No table is shown for non-road NO_x emissions since based on the MOVES model, the impact of relaxing RVP on non-road NO_x emissions is zero in all cases.

Table 2-1. Comparison of On-Road NO_x Emissions before and after Relaxation of Federal Summer RVP Requirements.

Pollutant and Region	Year	7.8 psi gasoline for 13 counties and 9.0 psi gasoline for 2 counties (plus 1 psi waiver for E10)	9.0 psi gasoline for 15 counties (plus 1 psi waiver for E10)	Emissions Increase with RVP Relaxation	Emissions Increase with RVP Relaxation
NO _x		tpd	tpd	tpd	%
13-county area	2018	94.49	94.78	0.29	0.31
	2020	76.49	76.70	0.21	0.28
	2025	55.61	55.74	0.13	0.23
	2030	34.74	34.78	0.05	0.14
	2035	29.08	29.10	0.02	0.07
	2040	23.43	23.42	-0.01	-0.04
2-county area	2018	11.45	11.45	0.0	0.0
	2020	9.49	9.49	0.0	0.0
	2025	7.16	7.16	0.0	0.0
	2030	4.82	4.82	0.0	0.0
	2035	4.36	4.36	0.0	0.0
	2040	3.90	3.90	0.0	0.0
15-county NAA ⁵	2018	105.94	106.23	0.29	0.27
	2020	85.98	86.19	0.21	0.24
	2025	62.77	62.90	0.13	0.21
	2030	39.56	39.60	0.05	0.13
	2035	33.44	33.46	0.02	0.06
	2040	27.33	27.32	-0.01	-0.04

2.1.2 VOC Emissions Analysis

VOC emissions were also analyzed using MOVES 2014a to show the change in mobile emissions from relaxation of the Federal summer RVP requirements. Modeling assumptions, inputs, and files for VOC can be found in Appendix A. Figure 2-2 shows a trend similar to that of the NO_x emissions where emissions increases from switching to a higher RVP gasoline are minimal, and continue to decrease into the future. For VOCs, the impacts are greater than NO_x as can be seen in Figure 2-2 and Tables 2-2 and 2-3 because VOC

⁵In final calculations for the NAA, an additional 0.03 tons/day would be added to these values to account for the Senior Exemption. Senior citizens are exempt from the Inspection and Maintenance (I/M) program testing and thus 0.03 tons/day (based on 2002 emissions comparisons) is used as a conservative estimate of disbenefit.

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emissions are not only associated with combustion, but also evaporative emissions which are directly linked to RVP. Also taken into consideration are the improved evaporative controls on newer vehicles. As more aged vehicles are replaced with newer cleaner vehicles, the increase in VOC emissions after relaxation of the Federal summer RVP requirements decreases over time (see Figure 2-2 and Table 2-2) for on-road vehicles. The basis for the years illustrated in Tables 2-2 and 2-3 is described in Section 2.1.1.

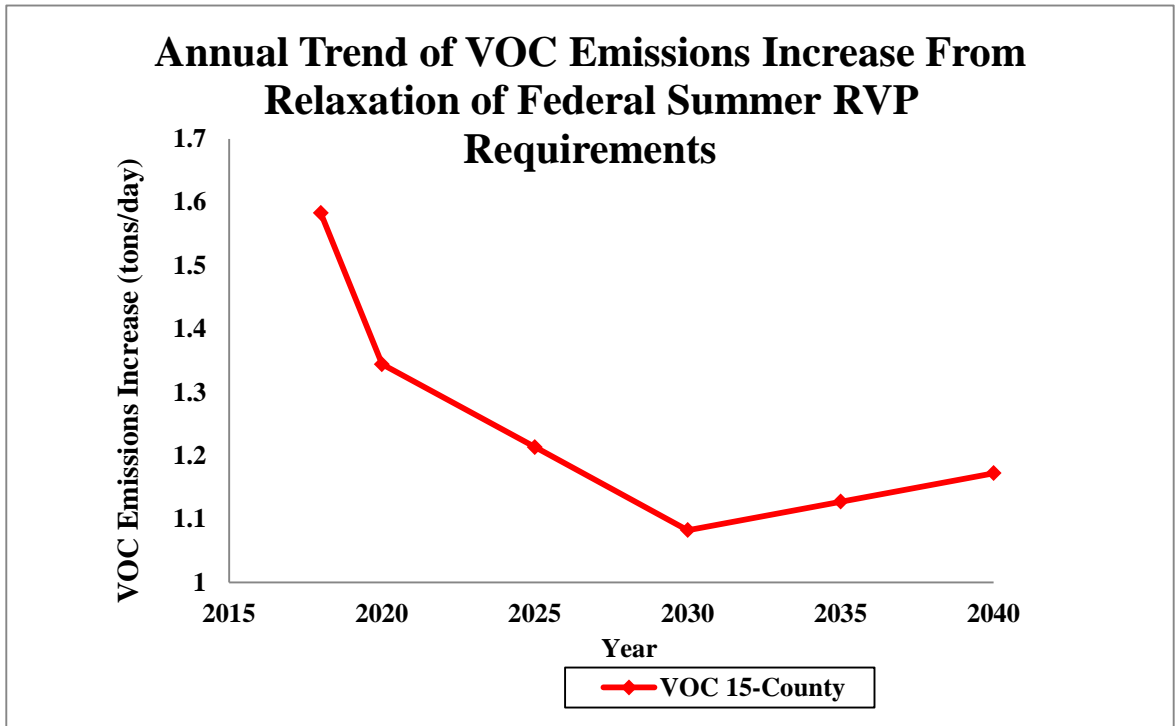


Figure 2-2: Annual Trend of VOC Emissions Increases from Relaxation of the Federal Summer RVP requirements.

VOC emissions increases, when comparing emissions in a given year, associated with the relaxation of the summer Federal RVP requirements in the 15-county maintenance area decrease from 0.75 tons/day in 2018 to approximately 0.11 tons/day in 2040 for on-road vehicle emissions as shown in Table 2-2 below. If emissions from non-road equipment, engines, and vehicles using standard gasoline are included in the total (non-road portion shown in Table 2-3), emissions increases drop from 1.58 tons/day in 2018 to approximately 1.17 tons/day in 2040 as illustrated in Figure 2-2 above.

Tables 2-2 and 2-3 also show the increase in emissions with RVP relaxation in the 13-, 2- and 15-county Atlanta areas and over a variety of years for on-road and non-road mobile sources. As can be seen in Table 2-2, the 2-county area emissions are unaffected by the relaxation because this area has always had a more relaxed RVP requirement. However, the 13- and 2-county areas make up the 15-county ozone maintenance area so it is important to illustrate the impact for the whole nonattainment area and how it is broken down into areas

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that initially did or did not need to adhere to the stricter RVP requirement. Also, the data in Table 2-2 demonstrates, through continued decrease in emissions over time for both RVP cases for all years and locations, how transportation conformity is maintained which applies only to on-road mobile emissions. For more details on non-road impacts, see Appendix A which contains the data files and calculations of non-road impacts for VOC. For further illustration of impacts over time, 2025 and 2035 years were interpolated and added to the analysis.

Table 2-2. Comparison of On-Road VOC Emissions before and after Relaxation of Federal Summer RVP Requirements.

Pollutant and Region	Year	7.8 psi gasoline for 13 counties and 9.0 psi gasoline for 2 counties (plus 1 psi waiver for E10)	9.0 psi gasoline for 15 counties (plus 1 psi waiver for E10)	Emissions Increase with RVP Relaxation	Emissions Increase with RVP Relaxation
VOC		tpd	tpd	tpd	%
13-county area	2018	62.14	62.89	0.75	1.21
	2020	53.64	54.14	0.50	0.94
	2025	43.26	43.59	0.32	0.75
	2030	32.89	33.03	0.14	0.43
	2035	28.56	28.69	0.13	0.45
	2040	24.24	24.36	0.11	0.47
2-county area	2018	5.46	5.46	0.0	0.0
	2020	4.72	4.72	0.0	0.0
	2025	3.83	3.83	0.0	0.0
	2030	2.93	2.93	0.0	0.0
	2035	2.59	2.59	0.0	0.0
	2040	2.26	2.26	0.0	0.0
15-county area NAA ⁶	2018	67.60	68.35	0.75	1.11
	2020	58.36	58.86	0.50	0.86
	2025	47.09	47.41	0.32	0.68
	2030	35.82	35.96	0.14	0.39
	2035	31.16	31.29	0.13	0.42
	2040	26.50	26.61	0.11	0.42

⁶In final calculations for the NAA, an additional 0.05 tons/day would be added to these values to account for the Senior Exemption. Senior citizens are exempt from the Inspection and Maintenance (I/M) program testing and thus 0.05 tons/day (based on 2002 emissions comparisons) is used as a conservative estimate of disbenefit.

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Table 2-3. Comparison of Non-Road VOC Emissions before and after Relaxation of Federal Summer RVP Requirements.

Pollutant and Region	Year	7.8 psi gasoline for 13 counties and 9.0 psi gasoline for 2 counties (plus 1 psi waiver for E10)	9.0 psi gasoline for 15 counties (plus 1 psi waiver for E10)	Emissions Increase with RVP Relaxation	Emissions Increase with RVP Relaxation
VOC		tpd	tpd	tpd	%
13-county area	2018	45.15	45.97	0.82	1.82
	2020	44.74	45.58	0.84	1.88
	2025	46.48	47.37	0.89	1.91
	2030	48.23	49.17	0.94	1.95
	2035	51.11	52.11	1.00	1.96
	2040	54.00	55.06	1.06	1.96
2-county area	2018	1.59	1.59	0.0	0.0
	2020	1.51	1.51	0.0	0.0
	2025	1.48	1.48	0.0	0.0
	2030	1.46	1.46	0.0	0.0
	2035	1.52	1.52	0.0	0.0
	2040	1.59	1.59	0.0	0.0
15-county area NAA	2018	46.74	47.56	0.82	1.75
	2020	46.25	47.09	0.84	1.82
	2025	47.97	48.86	0.89	1.86
	2030	49.69	50.63	0.94	1.89
	2035	52.64	53.64	1.00	1.90
	2040	55.59	56.65	1.06	1.91

2.2 Emissions Compared to Motor Vehicle Emissions Budgets

Motor vehicle emissions budgets provide limitations of on-road mobile emissions, so that future emissions from mobile sources will not interfere with the region’s ability to attain or maintain a NAAQS standard (2008 and 2015 ozone NAAQS specifically in this case). This section explains how relaxation of Federal summer RVP requirements does not require any changes to the motor vehicle emissions budget final totals nor interferes with transportation planning’s ability to continue to demonstrate conformity with the SIP budgets in place.

2.2.1 NO_x and VOC Emissions Analysis

Figure 2-3 shows the NO_x emissions for gasoline with and without RVP relaxation and how the emissions relate to the 2014 and 2030 MVEBs in Georgia’s 2008 Ozone NAAQS

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Maintenance Plan⁷ for the Atlanta 2008 8-hour ozone nonattainment area. The difference in the two lines is nearly indistinguishable showing how RVP relaxation will not significantly affect these trends or the magnitude of emissions. This includes the impact of this relaxation on on-road mobile emissions.

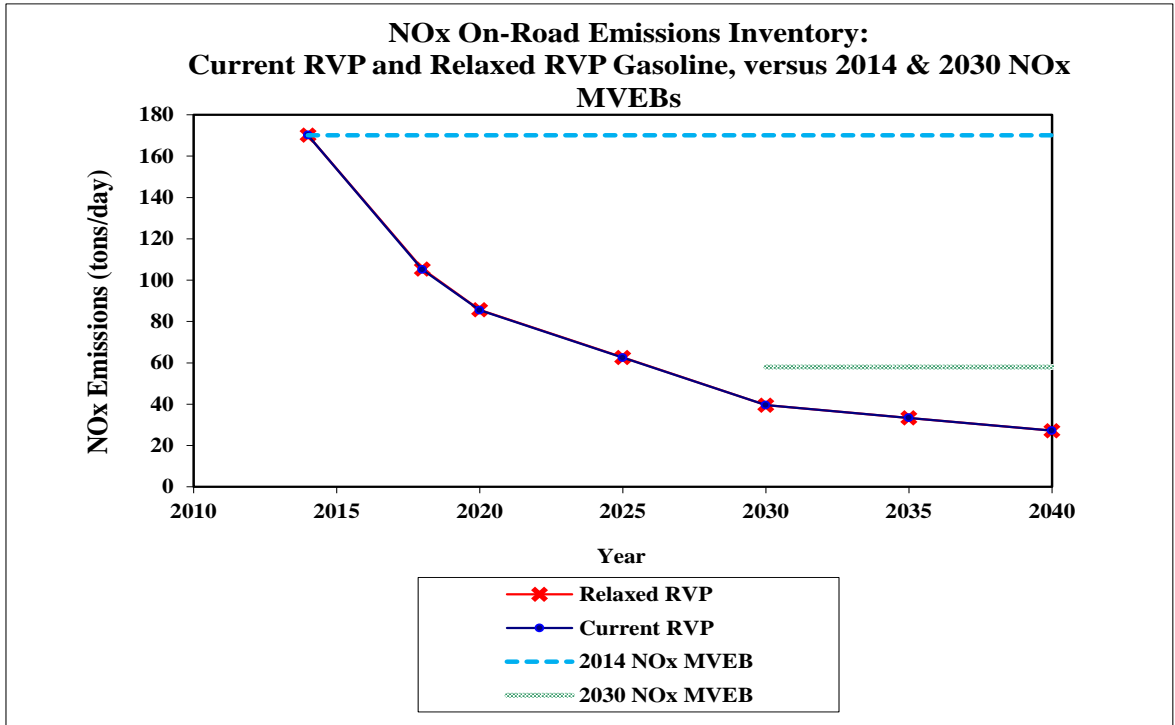


Figure 2-3: NOx Emissions: Comparison of Emissions, Current RVP and Relaxed RVP Gasoline to Budgets for the 2008 Ozone Maintenance Plan NAAQS.

The dashed line represents the 2014 NO_x MVEB and the green line describes the 2030 NO_x MVEB from Tables 4-1 and 4-2 in the 2008 8-hour ozone maintenance plan (82 FR 25523). The green line begins at 2030 because this budget only applies from 2030 onward in the maintenance plan. The emissions from current RVP gasoline and relaxed RVP gasoline are compared in this graph to the MVEBs to show that the relaxation of the RVP requirements clearly does not impact Atlanta’s ability to keep NO_x emissions below the MVEBs.

⁷Georgia’s Redesignation Request and Maintenance Plan for the Atlanta Ozone Nonattainment Area for the 2008 8-Hour Ozone NAAQS (05/25/2016)

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In both current RVP and relaxed RVP gasoline cases the NO_x emissions after 2014 are well below the 2014 MVEB while emissions from 2030-2040 never exceed the 2030 MVEB. Table 2-4 shows the NO_x emissions for both cases in comparison to the two MVEBs.

Table 2-4. Comparison of NO_x On-Road Emissions with Relaxed RVP Gasoline versus 2008 Ozone NAAQS Maintenance Plan MVEBs.

Year	2014 MVEB (tons/day)	2030 MVEB (tons/day)	Relaxed RVP Gas Emissions (tons/day)
2018	170.15	N/A	106.26
2020	170.15	N/A	86.22
2025	170.15	N/A	62.93
2030	170.15	58	39.63
2035	N/A	58	33.49
2040	N/A	58	27.35

A similar comparison can be made for VOC emissions. Figure 2-4 shows emissions from using current RVP gasoline versus relaxed RVP gasoline and how the emissions compare to the 2014 and 2030 MVEBs.

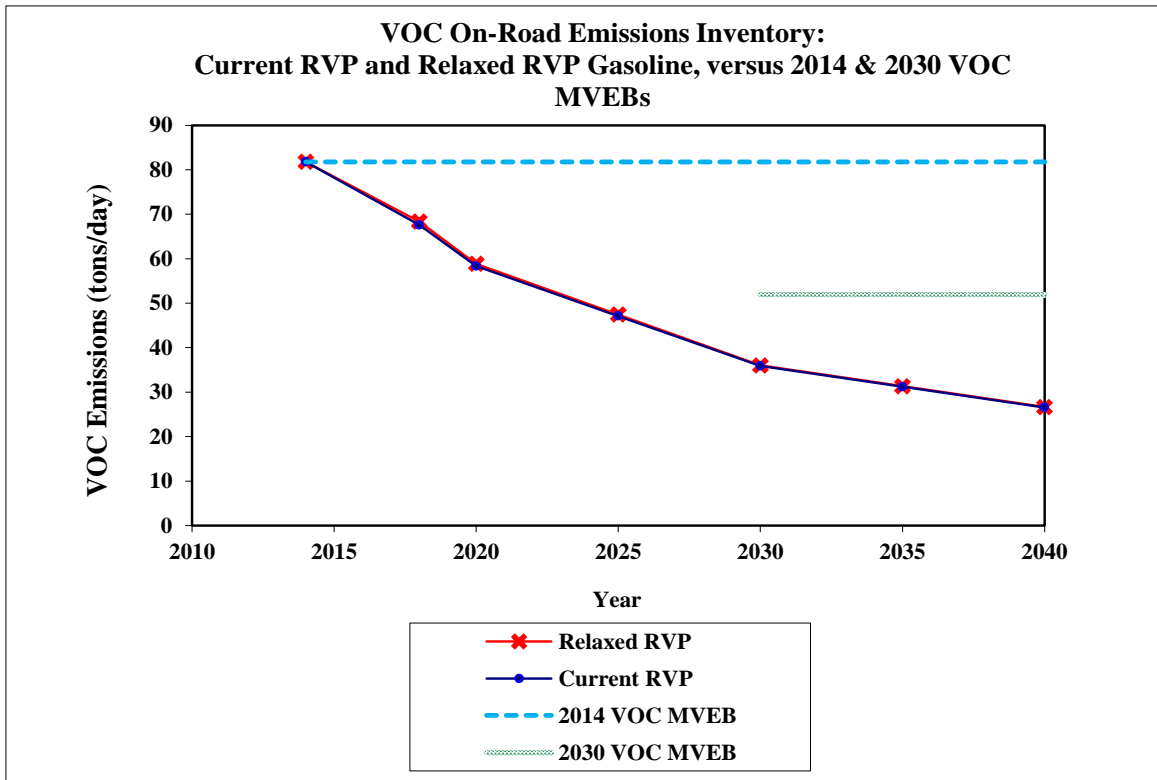


Figure 2-4: VOC Emissions: Comparison Using Current RVP and Relaxed RVP Gasoline to Budgets for the 2008 Ozone Maintenance Plan NAAQS.

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Similar to NO_x, the difference in the two lines for VOC is also extremely small showing how the relaxation of the RVP requirements will not significantly affect these trends or the magnitude of emissions.

The dashed line represents the 2014 VOC MVEB and the green line describes the 2030 VOC MVEB from Tables 4-1 and 4-2 in the 2008 8-hour ozone maintenance plan (82 FR 25523). The green line begins at 2030 because this budget only applies from 2030 onward in the maintenance plan. The emissions from current RVP and relaxed RVP gasoline are compared in this graph to the MVEBs to show that the relaxation of the Federal summer RVP requirements clearly does not impact Atlanta's ability to keep VOC emissions below the MVEBs.

In both the current RVP and relaxed RVP cases, the VOC emissions after 2014 are well below the 2014 MVEB while emissions from 2030-2040 never exceed the 2030 MVEB. Table 2-5 shows the VOC emissions for relaxed RVP gasoline in comparison to the two MVEBs.

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Table 2-5. Comparison of VOC On-Road Emissions with Relaxed RVP Versus 2008 Ozone NAAQS Maintenance Plan MVEBs.

Year	2014 MVEB (tons/day)	2030 MVEB (tons/day)	Relaxed RVP Gas Emissions (tons/day)
2018	81.76	N/A	68.40
2020	81.76	N/A	58.91
2025	81.76	N/A	47.46
2030	81.76	52	36.01
2035	N/A	52	31.34
2040	N/A	52	26.66

2.3 Attainment Inventory Comparison

Table 3-13 in Georgia's final approved redesignation request and maintenance plan for the 2008 8-hour ozone standard (June 2, 2017), shows the consolidated emissions projections of all metro Atlanta sources from 2014 to 2030. This 2008 plan (82 FR 25523) demonstrated that that future NO_x and VOC emissions through 2030, or the maintenance inventory, remained well below the emissions levels calculated in 2014, the attainment inventory year.

Due to newer planning assumptions used for modeling than what was used in the 2008 Ozone NAAQS Maintenance Plan, the NO_x and VOC emissions inventory numbers differ slightly for the current RVP. The 2008 Ozone NAAQS Maintenance Plan was revised to include these new numbers for 2030. (See Appendix B for the revised Emissions Inventory sections in the 2008 Ozone NAAQS Maintenance Plan.) The safety margins associated with the emissions inventory along with the portion of the safety margin allotted to motor vehicle emissions budgets were modified as well, but the updated budget totals themselves remain unchanged. See section 4.3 of the revised 2008 Ozone NAAQS Maintenance Plan (Appendix B) for more details on these adjustments. Also, note that only on-road emissions are impacted by RVP in MOVES for NO_x, with no change in non-road emissions in MOVES for NO_x. Non-road sources in MOVES do not include railroad, aircraft (the plane itself), or marine.

A comparison of the attainment inventory with the emissions that result from the relaxation of the Federal summer RVP requirements has been made and confirms that relaxed RVP gasoline emissions remain below those in the attainment inventory just as in the case with current RVP gasoline. If current and future emissions of precursors to NAAQS pollutants such as NO_x and VOC are shown to be below the emissions levels determined for a year making up part of the first attaining 3-year design value, then it is assumed that the Atlanta region will continue to have ozone concentration levels below the 2008 ozone standards.

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2.3.1 Total NO_x Emissions and the 2014 Attainment Inventory

Figure 2-5 shows that there is no discernable difference in the total NO_x emissions inventory between using current RVP and relaxed RVP gasoline; and both are well below the 2014 attainment inventory.

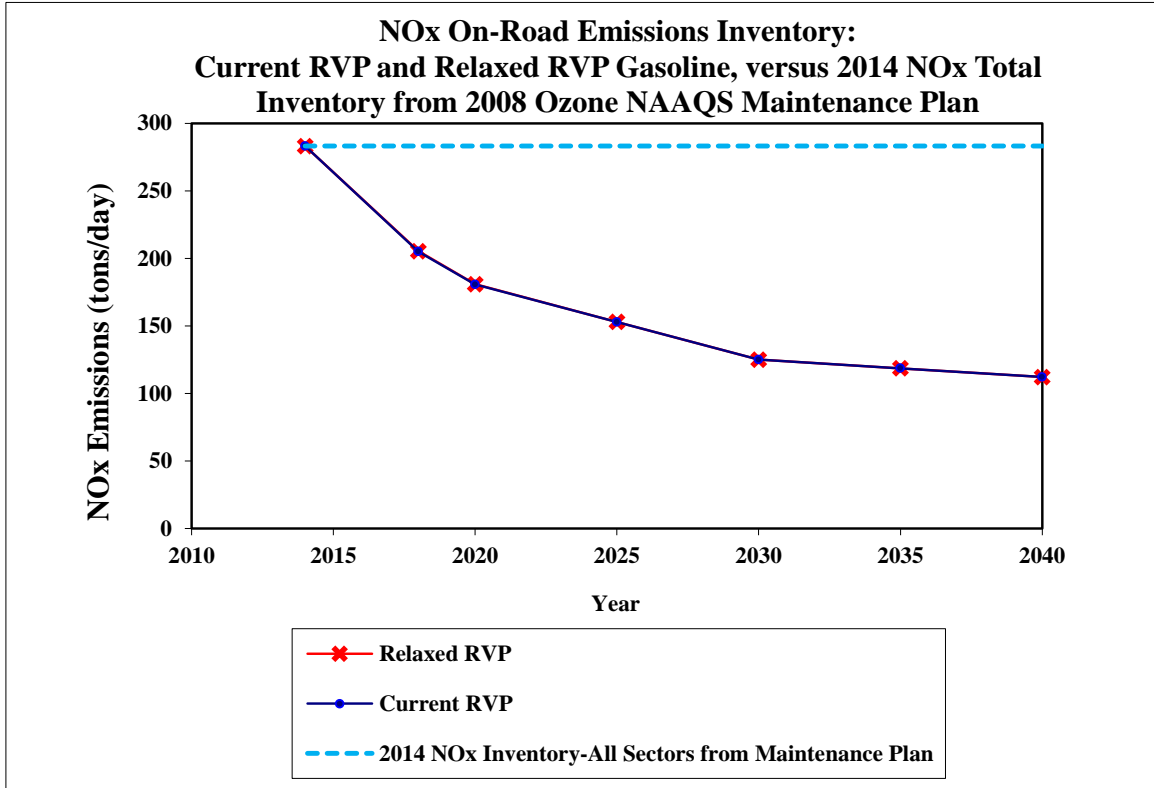


Figure 2-5: Comparison of Total NO_x Emissions Inventory: Georgia Current and Relaxed RVP Gasoline vs. 2014 Attainment Inventory.

Table 2-6 shows the difference between the total NO_x emissions inventory for both current and relaxed RVP gasoline as well as the total 2014 NO_x attainment inventory. This table also determines the margin between the quantified emissions for both RVP scenarios and the total 2014 NO_x attainment inventory, which represents the maximum allowable emissions before continued attainment of the 2008 8-hour ozone standard may be jeopardized. A large margin as seen here for both relaxed and current RVP indicates that emissions are well below a level where there would be any concern. The 2014 value for “current RVP gasoline inventory” is taken straight from the maintenance plan so it exactly matches the attainment inventory value, with a beginning margin of zero.

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Table 2-6. 2014 NO_x Attainment Inventory Comparison to Current RVP Gasoline Margin and Relaxed RVP Gasoline Margin.

Year	Total 2014 NO _x Attainment Inventory	Total NO _x Emissions Inventory with Current RVP Gasoline	Total NO _x Emissions Inventory with Relaxed RVP Gasoline	Current RVP Gasoline Margin (NO _x)	Relaxed RVP Gasoline Margin (NO _x)
	tpd	tpd	tpd	tpd	tpd
2014	283.09	283.09	N/A	0	N/A
2018	283.09	205.86	206.15	77.23	76.94
2020	283.09	181.23	181.44	101.86	101.65
2025	283.09	153.16	153.29	129.93	129.80
2030	283.09	125.09	125.14	158.00	157.95
2035	283.09	118.67	118.69	164.42	164.40
2040	283.09	112.25	112.24	170.84	170.85

A comparison of the attainment inventory with the emissions that result from the relaxation of the RVP requirements, confirm that relaxed RVP gasoline emissions remain below those in the attainment inventory. After calculating the margin for both current and relaxed RVP gasoline, it is important to evaluate the amount of the margin allotted to the relaxation of the Federal summer RVP requirements. In Table 2-7, the increase in NO_x emissions with relaxation of the RVP requirements is 0.05 tons/day or just 0.03% of the margin in 2030.

Table 2-7. NO_x Margin Allotted to Relaxed RVP Gasoline.

Year	Current RVP Gasoline Margin (NO _x)	Relaxed RVP Gasoline Margin (NO _x)	Amount of Margin Allotted to Relaxation of RVP Requirements	% of Margin Allotted to Relaxation of RVP Requirements
	tpd	tpd	tpd	%
2018	77.23	76.94	0.29	0.38
2020	101.86	101.65	0.21	0.21
2025	129.93	129.80	0.13	0.10
2030	158.00	157.95	0.05	0.03
2035	164.42	164.40	0.02	0.01
2040	170.84	170.85	-0.01	0

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2.3.2 Total VOC Emissions and the 2014 Attainment Inventory

Figure 2-6 shows a slight difference in the total VOC emissions inventory when comparing current RVP and relaxed RVP gasoline. However, just as in the case of the total NO_x emissions inventory, both stay well below the 2014 attainment inventory.

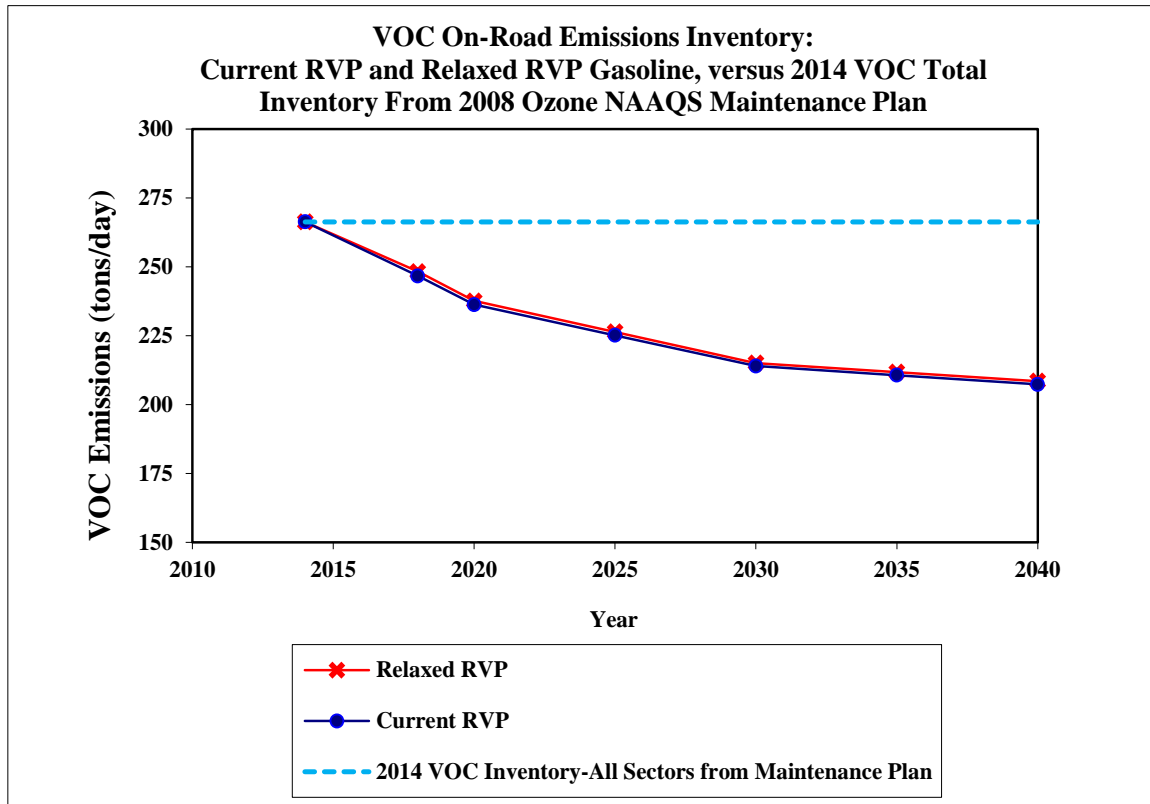


Figure 2-6: Comparison of Total VOC Emissions Inventory: Current and Relaxed RVP Gasoline vs. 2014 Attainment Inventory.

Table 2-8 shows the difference between the total VOC emissions inventory for current and relaxed RVP gasoline and the calculation results used to determine the margin for both of them. In both cases, the margins increase beginning in 2014 through to the year 2040. The 2014 value for “current RVP gasoline inventory” is taken straight from the maintenance plan so it exactly matches the attainment inventory value, with a beginning margin of zero.

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Table 2-8. 2014 VOC Attainment Inventory Comparison to Current RVP Gasoline Margin and Relaxed RVP Gasoline Margin.

Year	Total 2014 VOC Attainment Inventory	Total VOC Emissions Inventory with Current RVP Gasoline	Total VOC Emissions Inventory with Relaxed RVP Gasoline	Current RVP Gasoline Margin (VOC)	Relaxed RVP Gasoline Margin (VOC)
	tpd	tpd	tpd	tpd	tpd
2014	266.25	266.25	N/A	0	N/A
2018	266.25	246.71	248.29	19.54	17.96
2020	266.25	236.32	237.67	29.93	28.58
2025	266.25	225.15	226.36	41.10	39.89
2030	266.25	213.97	215.06	52.28	51.19
2035	266.25	210.64	211.77	55.61	54.48
2040	266.25	207.31	208.48	58.94	57.77

A comparison of the attainment inventory with the emissions that result from relaxing the Federal summer RVP gasoline requirements confirm that relaxed RVP emissions remain below those in the attainment inventory. After calculating the margin for both current and relaxed RVP gasoline, it is important to evaluate the amount of the margin allotted to the relaxation of the Federal summer RVP. In Table 2-9, the increase in VOC emissions with relaxation of the RVP requirements is 1.08 tons/day or just 2.07% of the margin in 2030. Of the 1.08 tons/day increase, 0.14 tons/day is attributed to on-road emissions and 0.94 tons/day from non-road based on MOVES runs which provide emissions for both sectors.

Table 2-9. VOC Margin Allotted to Relaxed RVP Gasoline.

Year	Current RVP Gasoline Margin (VOC)	Relaxed RVP Gasoline Margin (VOC)	Amount of Margin Allotted to Relaxation of RVP Requirements	% of Margin Allotted to Relaxation of RVP Requirements
	tpd	tpd	tpd	%
2018	19.54	17.96	1.58	8.09
2020	29.93	28.58	1.34	4.48
2025	41.10	39.89	1.21	2.94
2030	52.28	51.19	1.08	2.07
2035	55.61	54.48	1.13	2.03
2040	58.94	57.77	1.17	1.99

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3.0 NO_x and VOC Sensitivity

As stated in Section 1.0, 110(l) of the CAA requires that a SIP revision not interfere with any applicable requirement concerning attainment, and reasonable further progress (as defined in section 171 and 182 of the CAA). This section will demonstrate that the emissions increases resulting from the relaxation of the RVP from 7.8 psi (with a 1.0 psi waiver for E10) to 9.0 psi (with a 1.0 psi waiver for E10) will have insignificant to no impact on ozone concentrations in the Atlanta area.

3.1 Sensitivity of Ozone in Atlanta to NO_x and VOC Emissions

Control of NO_x and VOC are generally considered the most important components of an ozone control strategy, and NO_x and VOC make up the largest controllable contribution to ambient ozone formation. However, the metro Atlanta nonattainment/maintenance area has shown a greater sensitivity of ground-level ozone to NO_x controls rather than VOC controls. This is due to high biogenic VOC emissions compared to anthropogenic VOC emissions in Georgia. Therefore, implemented control measures have focused on the control of NO_x emissions. The Atlanta nonattainment/maintenance area is NO_x limited in such a way that changes in anthropogenic VOC emissions have little effect on ozone formation.

3.1.1 Sensitivity Modeling NO_x and VOC Emissions

As part of the Southeastern Modeling Analysis and Planning (SEMAP) project, Georgia Institute of Technology performed an analysis of the sensitivity of ozone concentrations in the Eastern U.S. to reductions in emissions of both NO_x and VOCs. This analysis was based off of the 2007 and 2018 SEMAP modeling which used the Community Multi-scale Air Quality (CMAQ) model, version 5.01 with updates to the vertical mixing coefficients and land-water interface. May 1st through September 30th was modeled using a 12-km modeling grid that covered the Eastern U.S. Details of the modeling platform set-up can be found in Appendix C.

3.1.2 Modeling Scenarios

Sensitivities were modeled relative to 2018 emissions to evaluate the impact of NO_x and VOC reductions on daily 8-hour maximum ozone concentrations. Each emissions sensitivity run reduced the 2018 anthropogenic NO_x or VOC emissions (point, area, mobile, non-road, marine/aircraft/rail) within a specific geographic region by 30%.

Georgia EPD examined the normalized sensitivities of NO_x and VOC emissions on 8-hour daily maximum ozone concentrations (ppb ozone/TPD) at 9 ozone monitors in Atlanta. For further details on the approach used to calculate the normalized sensitivities of NO_x and VOC, please see Appendix D.

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3.1.3 Modeling Results

Table 3-1. Normalized NO_x and VOC Sensitivity at 9 Atlanta Ozone Monitors.

AIRS ID	Site Name	NO_x (ppb/TPD)	VOC (ppb/TPD)
13-067-0003	Kennesaw	-0.0741	-0.0049
13-077-0002	Newnan	-0.0806	-0.0018
13-085-0001	Dawsonville	-0.0513	-0.0001
13-089-0002	South DeKalb	-0.0874	-0.0069
13-097-0004	Douglasville	-0.0797	-0.0042
13-121-0055	Confederate Ave.	-0.0643	-0.0105
13-135-0002	Gwinnett	-0.0763	-0.0026
13-151-0002	McDonough	-0.0869	-0.0034
13-247-0001	Conyers	-0.0906	-0.0033
AVERAGE		-0.0768	-0.0042

The results in Table 3-1 show that NO_x emissions reductions are generally 15-25 times more effective than VOC emissions reductions at reducing ozone concentrations. In order to look at the impact of removing NO_x or VOC controls on the 2008 ozone NAAQS, the site-specific normalized sensitivities are multiplied by the increase in NO_x and/or VOC emissions.

The site-specific normalized NO_x and VOC sensitivities were applied to the expected emissions increases due to the relaxation of the RVP from 7.8 psi (with a 1.0 psi waiver for E10) to 9.0 psi (with a 1.0 psi waiver for E10). The emissions increases are based on 2018 values and represent the largest impact as the emissions increase will decrease each successive year. The relaxation of the RVP results in an increase of VOC emissions of 1.58 tons per day in 2018. This includes non-road vehicles and represents the largest impact. The relaxation of the RVP results in an increase of 0.29 tons per day of NO_x in 2018 in the 15-county area decreasing over time to near zero by 2040. The corresponding ozone increases at each monitor are found in Table 3-2 and demonstrate insignificant increases in ozone concentrations. The calculated changes in ozone levels are well below the level of precision of the ambient ozone monitors (1 ppb). In addition, ozone concentrations are reported to EPA in ppm and to three decimal places (e.g., 0.070 ppm) and any additional decimal places

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are truncated. Since the corresponding ozone increase at all 9 monitors would only be seen at the fifth decimal place, these small increases could not impact maintenance or attainment of any ozone NAAQS.

Table 3-2. Emissions Increases Due to Relaxation of the RVP and Effects on Ozone Formation.

Monitor	Relaxation of the RVP from 7.8 psi to 9.0 psi (with a 1.0 psi waiver)				Combined
	2018 NO _x Emissions Increase (tons/day)	Corresponding Ozone Increase at Monitor due to NO _x Increase (ppb)	2018 VOC Emissions Increase (tons/day)	Corresponding Ozone Increase at Monitor due to VOC Increase (ppb)	Corresponding Ozone Increase at Monitor (ppb)
Kennesaw	0.29	0.02149	1.58	0.00776	0.029
Newnan	0.29	0.02337	1.58	0.00278	0.026
Dawsonville	0.29	0.01488	1.58	0.00009	0.015
South DeKalb	0.29	0.02536	1.58	0.01083	0.036
Douglasville	0.29	0.02311	1.58	0.00658	0.030
Confederate Ave.	0.29	0.01864	1.58	0.01663	0.035
Gwinnett	0.29	0.02211	1.58	0.00417	0.026
McDonough	0.29	0.02521	1.58	0.00530	0.031
Conyers	0.29	0.02628	1.58	0.00521	0.031

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4.0 Emissions Offsets

Offset measures may be considered in a state's 110(l) demonstration where VOC or NO_x emissions have increased due to the relaxation or removal of a rule or a program in a nonattainment area. If an offset measure is used, it must be reproducible, enforceable, surplus, quantifiable, and a permanent measure. Surplus is defined in 40 CFR 51.491 as "at a minimum, emissions reductions in excess of an established program baseline which are not required by SIP requirements or State regulations, relied upon in any applicable attainment plan or demonstration, or credited in any reasonable further progress (RFP) or milestone demonstration, so as to prevent the double-counting of emissions reductions."

4.1 Emissions Increase

As indicated in sections 2.1.1 and 2.1.2, the relaxation of the RVP from 7.8 to 9.0 psi (with a 1.0 psi waiver for E10) results in an increase of 2018 NO_x emissions of 0.29 tons per day (an equivalent RVP season emissions increase of 31.03 tons) and 1.58 tons per day (an equivalent RVP season emissions increase of 169.06 tons). The RVP season for the 13-county area is 107 days per calendar year (June 1 to September 15).

$$0.29 \text{ tons/day NO}_x * 107 \text{ days/year} = \mathbf{31.03 \text{ tons/year NO}_x}$$

$$1.58 \text{ tons/day VOC} * 107 \text{ days/year} = \mathbf{169.06 \text{ tons/year VOC}}$$

Section 3 addresses ozone formation in the Atlanta area and the sensitivity to reductions of NO_x and VOC emissions. The Atlanta area is a NO_x limited area; therefore, the control of NO_x emissions result in greater reductions of ozone compared to VOC emissions. The maximum VOC emissions increase resulting from the relaxation of the RVP from 7.8 psi (with a 1.0 psi waiver for E10) to 9.0 psi (with a 1.0 psi waiver for E10) is 1.58 tons per day (169.06 tons/year). This increase in VOC emissions can be converted to an equivalent increase in NO_x emissions based on the ratio of normalized ozone sensitivities described in Section 3 as follows:

$$169.06 \text{ tons/year VOC} * (-0.00417 \text{ ppb/TPD VOC}) / (-0.07680 \text{ ppb/TPD NO}_x) \\ = \mathbf{9.179 \text{ tons/year NO}_x}$$

By adding the actual NO_x emissions increase to the equivalent NO_x emissions increase from VOC emissions using the sensitivity calculation, the resulting offset NO_x emissions are:

$$31.03 \text{ tons/year of NO}_x + 9.179 \text{ tons/year of NO}_x \text{ (VOC equivalent reduction)} \\ = \mathbf{40.21 \text{ tons/year NO}_x \text{ offsets required.}}$$

4.2 Emissions Offsets

Georgia EPD is securing NO_x emissions offsets to ensure that the 15-county 2008 8-hour ozone maintenance area with the RVP relaxation will not interfere with attainment of the

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2015 ozone NAAQS for the 7-county Atlanta nonattainment area. Georgia proposes to demonstrate noninterference by substituting quantifiable, permanent, surplus, enforceable, and contemporaneous measures described herein to achieve equivalent emissions reductions to offset the potential emissions increases. The following is an analysis with supporting calculations to determine the offsets needed to address the relaxation of RVP from 7.8 psi (with a 1.0 psi waiver for E10) to 9.0 psi (with a 1.0 psi waiver for E10) that will take place in the 15-county 2008 8-hour ozone maintenance area. As described more fully in this submission, a minimum of 38.81 tons/year NO_x emissions reductions have been achieved through implementation of the Locomotive Conversion Program, and a minimum of 7.20 tons/year of NO_x emissions reductions have been achieved through school bus early replacements. As such, these measures will fully offset the expected emissions increases associated with relaxing the Federal 7.8 psi gasoline RVP limit that currently applies in the 13-county Atlanta area.

As previously discussed, the Atlanta Area is NO_x-limited; therefore, the impact on ozone formation of reducing NO_x emissions is greater than it is for reducing emissions of VOCs. Accordingly, for purposes of calculating the emissions reductions necessary to offset the relaxation of Federal gasoline volatility requirements of 40 CFR 80.27(a)(2) from the SIP, Georgia is relying on NO_x emissions reductions. As described in this SIP revision, Georgia performed a sensitivity analysis to calculate the NO_x equivalent emissions reductions necessary to offset the expected emissions increase in NO_x and VOCs associated with relaxation of Federal gasoline volatility requirements of 40 CFR 80.27(a)(2).

4.2.1 Locomotive Conversion Offsets

Georgia EPD has worked with the railroad industry to replace higher-emitting, existing diesel locomotive engines with lower emitting locomotive engines. As such, the Georgia Department of Natural Resources has entered into a contract with the Norfolk Southern Railway Company (see attached contract dated July 20, 2016 in Appendix E) to complete locomotive engine modifications that will reduce NO_x emissions in the nonattainment area. In total, these locomotive conversions will reduce NO_x emissions by 38.81 tons per year for 10 years or longer. The project is funded through the Federal Highway Administration's Congestion Mitigation and Air Quality (CMAQ) Program through a memorandum of understanding between the Georgia Department of Transportation and Georgia EPD.

The majority of switcher locomotives in use across the country today are old (TIER 0 or Unregulated) with high emissions of PM, NO_x, and VOC. These older, switcher locomotives will typically remain in service for an extensive time (in excess of 50 years) because of the high capital cost of new locomotives. While the contract only requires a ten-year commitment, this project should have long-lasting air quality benefits for the region. This particular CMAQ project includes the deployment of the following:

1. Norfolk Southern Railway, Inc. converted three older traditional switcher locomotives into newly-available low-emissions engine technology.

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2. Norfolk Southern Railway, Inc. converted two switchers into ‘slugs’, which are driven by electrical motors whose electricity is received from companion ‘mother’ locomotives. This configuration is referred to as ‘mother-slug’ locomotives. The slugs do not have any direct emissions.

As shown in Table 4-1, the emissions reductions occurred in 2017, within the contemporaneous period.

Table 4-1. Locomotive Conversion Schedule and NO_x Reductions.

Month and Year of Reductions	Areas	Source*	Annual NO _x Emission Reduction (tons/yr)
December 2017	Atlanta-General	Railroad (NS - 3 Mothers 2 Slugs)	38.81
		Railroad Total Available	38.81

NO_x reductions from these locomotive conversions will yield 38.81 tons/year in Atlanta. Further details regarding the locomotive reductions can be found in Appendix E.

4.2.2 School Bus Early Replacement Offsets

Georgia EPD has a strong school bus early replacement program. School bus replacement projects were completed in 2017 using DERA funding have resulted in NO_x emissions reductions of 7.20 tons per year in the Atlanta metro nonattainment area. Specifically, five old school buses (built in 2000-2003) in Paulding County were replaced with five 2017 school buses. Also, forty old school buses (built in 1999-2003) in Fulton County were replaced with forty 2017 school buses. Calculations of NO_x emission reductions are in Appendix E.

Table 4-2. School Bus Early Replacement Schedule and NO_x Reductions.

Month and Year of Reductions	Areas	Source*	Annual NO _x Emissions Reduction (tons/yr)
July-August 2017	Atlanta-Fulton	Bus Replacement	6.51
September 2017	Atlanta-Paulding	Bus Replacement	0.687
		Bus Replacement Total Available	7.20

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4.3 Offset Equivalency Demonstration

Based on the available offsets from the locomotive conversion projects and school bus early replacement projects, Georgia EPD has offsets in excess of the increase in emissions associated with relaxing the Federal gasoline volatility requirements of 40 CFR 80.27(a)(2). Tables 4-3 and 4-4 summarize the emissions increases and the available offsets for comparison.

Table 4-3. Emissions Decrease Due to Locomotive Conversions and School Bus Replacements.

Source of Offset	Locomotive Conversions (tons/yr)	School Bus Replacements (tons/yr)	Total Decrease (tons/yr)
NO _x Emissions Decrease	38.81	7.20	46.01

The offsets available from both bus replacements and locomotive conversions total 46.01 tons per year NO_x. As shown in Table 4-4, the annual NO_x decrease from the locomotive conversions and school bus replacements are more than adequate to offset the maximum NO_x and VOC emissions increases (40.21 tons per year of equivalent NO_x) associated with relaxing the Federal gasoline volatility requirements of 40 CFR 80.27(a)(2) for Georgia. There is a 5.80 ton per year residual NO_x emissions offset that will remain available.

Table 4-4. Emissions Increases Compared to Available Emissions Offsets.

Emissions Increases Due to Relaxing 40 CFR 80.27(a)(2) GA RVP Requirements (tons/year)	Total Offsets Available (tons/yr)	Residual Offsets (tons/yr)
40.21	46.01	5.80

Georgia has demonstrated noninterference by substituting quantifiable, permanent, surplus, enforceable, and contemporaneous measures described above to achieve equivalent emissions reductions to offset the potential emission increases related to the relaxation of the Federal RVP requirements. The locomotive conversions and school bus replacements occurring in 2017 are surplus since they have not been relied upon by any attainment plan or demonstration or credited in any RFP demonstration. The old locomotive diesel engines and school buses have been destroyed; therefore, the emission reductions are permanent. The emissions reductions have been quantified in Appendix E. Enforceability of the emissions reductions from locomotive conversions and school bus replacements are addressed in the contract commitments that are included in Appendix E. The locomotive and school replacements are contemporaneous since they occurred within one year of this submittal.

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5.0 Conclusion

Georgia EPD is requesting a relaxation of the Federal summertime Reid Vapor Pressure (RVP) gasoline requirement in the gasoline volatility rule at 40 CFR 80.27(a)(2) as it pertains to Georgia. This request also includes a 110(l) noninterference demonstration. The noninterference demonstration shows that modifying the Federal gasoline volatility rule, 40 CFR 80.27(a)(2), *Controls and prohibitions on gasoline volatility: Prohibited activities in 1992 and beyond* by relaxing the RVP gasoline requirement of 7.8 psi (with a 1.0 psi waiver for E10) to 9.0 psi (with a 1.0 psi waiver for E10) for the 13-county designated volatility nonattainment area will not interfere with the attainment or maintenance of any NAAQS or any other CAA requirement as prescribed in section 110(l) of the CAA. Although this plan focuses on ozone, relaxation of the RVP will have little to no impact on emissions of PM, SO₂, NO₂, CO, or Pb, or their related precursors.

Relaxing the RVP gasoline requirement for Georgia to 9.0 psi (with a 1.0 psi waiver for E10) results in a NO_x emissions increase of 0.29 tons per day in 2018 that decreases to near zero by 2040. VOC emissions increase 1.58 tons per day in 2018 and decrease to 1.17 tons per day in 2040. If non-road equipment, engines, and vehicles using standard gasoline are excluded, VOC emissions increase decrease from 0.75 tons per day in 2018 to approximately 0.11 tons/day in 2040.

Furthermore, analysis shows that in both current RVP and relaxed RVP gasoline cases the NO_x and VOC emissions after 2014 are well below the 2014 MVEB while emissions from 2030-2040 never exceed the 2030 MVEB. A comparison of the NO_x and VOC attainment inventories with the NO_x and VOC emissions that result from relaxing the Federal summer RVP gasoline requirements confirm that relaxed RVP emissions remain below those in both attainment inventories.

With the State of Georgia being a NO_x limited area, the sensitivity of ozone formation in the Atlanta area to reductions of NO_x is greater than the sensitivity to reductions in VOC emissions. Site-specific normalized NO_x and VOC sensitivities were applied to the expected peak emissions increases of 2018 due to the relaxation of the RVP gasoline requirement. The corresponding ozone increases at the 9 ozone monitors in Atlanta were well below the level of monitoring precision (1 ppb). In addition, ozone concentrations (in ppm) are reported to EPA to three decimal places (e.g., 0.070 ppm) and any additional decimal places are truncated. Since the corresponding ozone increase at all 9 monitors would only be seen at the fifth decimal place, this small increase could not impact maintenance or attainment of any ozone NAAQS.

Offsetting emissions are available from the early replacement of school buses and locomotive retrofits that more than cover the increase in NO_x and VOC emissions resulting from the relaxation of the RVP gasoline requirement. These offsets are demonstrated to be contemporaneous, reproducible, enforceable, surplus, quantifiable, and permanent as

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required by 40 CFR 51 Appendix S. This plan secures an equivalent emissions reduction and the relaxation of RVP will not hinder Georgia's ability to attain the 2015 ozone standard and will not interfere with continued maintenance of the 1997 and 2008 8-hour ozone standards.

In addition, Georgia EPD is submitting a revised 2008 8-hour ozone maintenance plan with a supporting 110(l) demonstration. As a part of this SIP revision, the 2008 8-hour ozone maintenance plan has been revised with an updated emissions inventory for the on-road and non-road sectors, and updated motor vehicle emissions budgets (MVEB) and safety margins.

For these reasons, the relaxation of the RVP gasoline requirement to 9.0 psi (with a 1.0 psi waiver for E10) meets the requirements of 110(l).

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References

Controls and prohibitions on gasoline volatility, 40 CFR § 80.27

Georgia EPD 2015 Ozone NAAQS Designation Recommendation Letter, submitted to EPA on September 23, 2016.

EPA Region 4 Intended Area Designation for the 2015 Ozone NAAQS, received by Georgia EPD on December 20, 2017.

Georgia's Revised Designation Recommendations for the 2015 Ozone NAAQS, submitted to EPA on February 9, 2018.

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USEPA "Approval and Promulgation of Implementation Plans; Georgia: Changes to Georgia Fuel Rule and Other Miscellaneous Rules", 80 FR 52627 through 80 FR 52630, Final Rule, September 1, 2015.

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USEPA, National Emissions Inventory: Inventory years 2008, and 2014.