Regional Haze Periodic Progress Report
State Implementation Plan

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Georgia's Regional Haze Periodic Progress Report

Executive Summary

On February 11, 2010, Georgia submitted for approval its State Implementation Plan (SIP) revision for Regional Haze to EPA Region IV. The Regional Haze SIP documents Georgia's long-term plan for improving visibility in the State's three mandatory Class I Federal areas as well as assisting with improvement of visibility in Class I areas located outside of the State. The SIP includes specific "reasonable progress" goals for visibility improvement at milestones that start in 2018. The ultimate goal is to reach background visibility levels in the Class I areas by the year 2064. Georgia's three Class I areas are the Cohutta Wilderness Area, Okefenokee National Wildlife Refuge, and Wolf Island National Wildlife Refuge.

Subparagraph 40 CFR 51.308(g) of the regional haze rule requires periodic reports describing progress towards the reasonable progress goals. The first progress report is due five years from the submittal of the initial Regional Haze SIP. Therefore, Georgia's report is due not later than January of 2015.

The document comprised within the following pages is Georgia's periodic progress report on the progress made toward Georgia's 2018 reasonable progress goals. The progress report, in accordance with EPA's requirements, contains the following elements:

- status of implementation of the control measures included in the original SIP
- summary of the emissions reductions achieved through the above-referenced control measures
- assessment of visibility conditions and changes for each Class I area located within the state
- analysis tracking the change over the past 5 years in emissions of pollutants contributing to visibility impairment from all sources and activities within Georgia
- assessment of any significant changes in anthropogenic emissions within the past five years that have limited or impeded progress in reducing pollutant emissions and improving visibility
- assessment of whether the current SIP is sufficient to enable Georgia and other states to meet applicable reasonable progress goals
- review of Georgia's visibility monitoring strategy

The control strategy that was proposed in the original regional haze SIP focuses on the reduction of SO_2 emissions. Control measures that were included in the SIP included Federal programs, State requirements for EGUs, and State requirements for non-EGU point sources. The major Federal programs identified were the Clean Air Interstate Rule (CAIR) for EGUs and several rules requiring emissions reductions from on-road and non-road mobile sources. Due to court rulings, CAIR has been remanded to EPA to revise elements that were deemed unacceptable but the rule has been left in place while EPA completes its response to the court ruling. On-road and non-road emissions reduction measures have been implemented on time and will continue to provide reductions of SO_2 in the coming years.

State requirements for reductions of SO_2 emissions from EGUs and from non-EGU point sources have also been implemented on time. An estimated total of 184,000 tons/year of SO_2 emissions reductions has been achieved through implementation of State measures through calendar year 2009. The total estimated SO_2 reductions from State measures is expected to be approximately 450,000 tons/year by 2018.

Other emissions control programs have come into being since the regional haze SIP was submitted. These programs include emissions limits on ships traveling in coastal waters, control techniques guidelines, and the mercury and air toxics standard for EGUs. The regional haze SIP did not account for the additional emissions reductions that have resulted or will result from these programs.

Records of observed visibility impairment show declining trends over the period 2008 - 2010 in both the Cohutta Wilderness Area and the Okefenokee Wilderness Area. For the 20 percent worst visibility days, the 2006 - 2010 average observed visibility impairment in both areas is below the uniform glide path to reach natural background in 2064 and below the 2010 interpolated values for the regional progress goals. For the 20 percent best visibility days, the 2006 - 2010 average observed visibility impairment in both areas is below the baseline visibility impairment.

Wolf Island does not have a visibility impairment monitor. Due to proximity to Okefenokee, Wolf Island's visibility impairment and trends are assumed to be the same as those observed at the Okefenokee monitor.

Over the period 2002 through 2007, SO_2 emissions from all source sectors rose due to increased power demand and the fact that implementation of EGU emissions controls required by Georgia's Multipollutant rule did not start until 2008. The 2009 and 2010 "actual" total SO_2 emissions are both well below the 2002 VISTAS actual SO_2 emissions and 2009 VISTAS projected SO_2 emissions. The estimated change in emissions of SO_2 from all Georgia sources is a 56% reduction over the period 2002 – 2010. The 2009 actual SO_2 emissions are 37.1 % less than the 2009 projected SO2 emissions (2009G4), indicating that EGU SO_2 emissions reductions have occurred ahead of the schedule required by the Multipollutant rule.

As discussed above, all control measures outlined in Georgia's original regional haze SIP are on track to meet their implementation schedules. The change in emissions of SO_2 from all Georgia sources is a 56% reduction over the period 2002 - 2010, and visibility impairment observations through 2010 are better (lower) than the 2010 interpolated values for the reasonable progress goals. Therefore Georgia EPD believes that the State's current implementation plan elements and strategies are sufficient to enable the State and other states with Class I areas affected by emissions from Georgia sources to meet all established reasonable progress goals.

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Acronym	Meaning	Acronym	Meaning
AERR	Annual Emissions Reporting Requirements	IMPROVE	Interagency Monitoring of Protected Visual Environments
BART	Best Available Retrofit Technology	IPM	Integrated Planning Model
CAA	Clean Air Act	Mm^{-1}	Inverse megameter
CAIR	Clean Air Interstate Rule	MMBtu	Million Btu's
CERR	Consolidated Emissions Reporting Rule	NAAQS	National Ambient Air Quality Standard
CFR	Code of Federal Regulations	NO_x	Nitrogen Oxides
CSAPR	Cross-state Air Pollution Rule	PM	Particulate Matter
DNR	Department of Natural Resources	$PM_{2.5}$	Fine Particulate Matter
dv	deciview	PSC	Public Service Commission
EGU	Electric Generating Unit	RPO	Regional Planning Organization
EPA	Environmental Protection Agency	SEMAP	Southeastern Modeling, Analysis, and Planning project
EPD	Environmental Protection Division	SMP	Smoke Management Plan
FGD	Flue Gas Desulfurization	SO_2	Sulfur Dioxide
FLM	Federal Land Manager	tpy	tons per year
FR	Federal Register	VIEWS	Visibility Information Exchange Web System
FRM	Federal Reference Method	VISTAS	Visibility Improvement – State and Tribal Association of the Southeast

1.0 Introduction

This section provides background information on the science of regional haze, Clean Air Act requirements for reducing regional haze, Georgia's Class I areas, Georgia's strategy for reducing regional haze, and Georgia's reasonable progress goals. In addition, the content elements required for this periodic progress report are listed.

1.1 What is regional haze?

Regional haze is pollution from disparate sources that impairs visibility over large regions, including national parks, forests, and wilderness areas (156 of which are termed mandatory Federal Class I areas). Regional haze is caused by sources and activities emitting fine particles and their precursors. Those emissions are often transported over large regions.

Particles affect visibility through the scattering and absorption of light, and fine particles – particles similar in size to the wavelength of light – are most efficient, per unit of mass, at reducing visibility. Fine particles may either be emitted directly or formed from emissions of precursors, the most important of which are sulfur dioxides (SO_2) and nitrogen oxides (NO_x). Reducing fine particles in the atmosphere is generally considered to be an effective method of reducing regional haze, and thus improving visibility. Fine particles also adversely impact human health, especially respiratory and cardiovascular systems. The United States Environmental Protection Agency (USEPA) has set national ambient air quality standards for daily and annual levels of fine particles with diameter smaller than 2.5 micrometers ($PM_{2.5}$). In the southeast, the most important sources of $PM_{2.5}$ and its precursors are coal-fired power plants, industrial boilers and other combustion sources. Other significant contributors to $PM_{2.5}$ and visibility impairment include mobile source emissions, area sources, fires, and wind-blown dust.

1.2 What are the requirements under the Clean Air Act for addressing regional haze?

Section 169A of the Clean Air Act (CAA) established a program for protecting visibility in mandatory Federal Class I areas. Section 169A also required the USEPA to issue regional haze rules. The regional haze rules integrate provisions addressing regional haze visibility impairment and establishing a comprehensive visibility protection program for Class I Federal areas. The rules require each affected state to submit a state implementation plan (SIP) to EPA that sets out its plan for complying with the regional haze rules.

The core requirements (i.e., elements) for the SIP are presented at 40 CFR 51.308(d) and include:

- Reasonable progress goals for visibility improvement (i.e, reduced impairment) at milestones starting in 2018
- Calculations of baseline (2000 – 2004) and natural visibility conditions
- Long-term strategy for achieving the 2018 reasonable progress goals, including enforceable emissions limitations and compliance schedules
- Monitoring strategy for measuring, characterizing, and reporting of visibility impairment that is representative of the State's Class I areas

Georgia submitted its regional haze SIP to EPA on February 11, 2010, and submitted associated non-EGU facility permit revisions November 19, 2010. On June 7, 2012, EPA published (77 FR 33642) a limited disapproval of Georgia's SIP submittal on the basis that reliance on the CAIR rule must be

replaced with reliance on the CSAPR rule, which EPA would do with a Federal Implementation Plan (FIP). The status of the FIP is now in question since CSAPR was been vacated by the U.S. Court of Appeals. On June 28, 2012, EPA published (77 FR 38501) a limited approval of Georgia's regional haze SIP submittal on the basis that the submittal, on the whole, strengthens the Georgia SIP.

Following submission of the SIP, the regional haze rules require follow-up on the success of the long-term strategy at specific intervals through the year 2064. 40 CFR 51.308(g) requires periodic reports describing progress towards the reasonable progress goals. The first periodic progress report is due five years from the submittal of the initial regional haze SIP. In the periodic report, the State must include an assessment of whether the current SIP elements and strategies are sufficient to meet the State's (and other states') established reasonable progress goals. Concurrently, with submittal of the progress report, the State must communicate to EPA its assessment of the adequacy of the SIP to meet its and other affected states' 2018 reasonable progress goals (40 CFR 51.308(h)). If it is determined that the SIP is not adequate, the State must take specified additional measures.

In 2018, the State is required to revise its regional haze SIP and submit the revision to EPA (40 CFR 51.308(f)). In the SIP revision the State must evaluate and reassess the core SIP elements (see above). In evaluating and reassessing, the State must address:

- Current visibility conditions and progress made during the previous ten-year implementation period
- The effectiveness of the long-term strategy to date
- Affirmation of, or revision to, the reasonable progress goals going forward from the current conditions

Additional SIP revisions are required every ten years through the year 2064.

1.3 Class I areas in Georgia

Georgia has three Class I areas within its borders: Cohutta Wilderness Area, Okefenokee National Wildlife Refuge, and Wolf Island National Wildlife Refuge. Cohutta is located at the Georgia-Tennessee border and Okefenokee and Wolf Island are located in the extreme southeast corner of the State (see Figure 1-1). The Federal Land Manager (FLM) responsible for each area is shown in Table 1-1.

Table 1-1. Georgia's Class I Areas and Responsible FLMs

Class I Area	Responsible FLM
Cohutta Wilderness Area	U. S. Forest Service
Okefenokee National Wildlife Refuge	U. S. Fish and Wildlife Service
Wolf Island National Wildlife Refuge	U. S. Fish and Wildlife Service

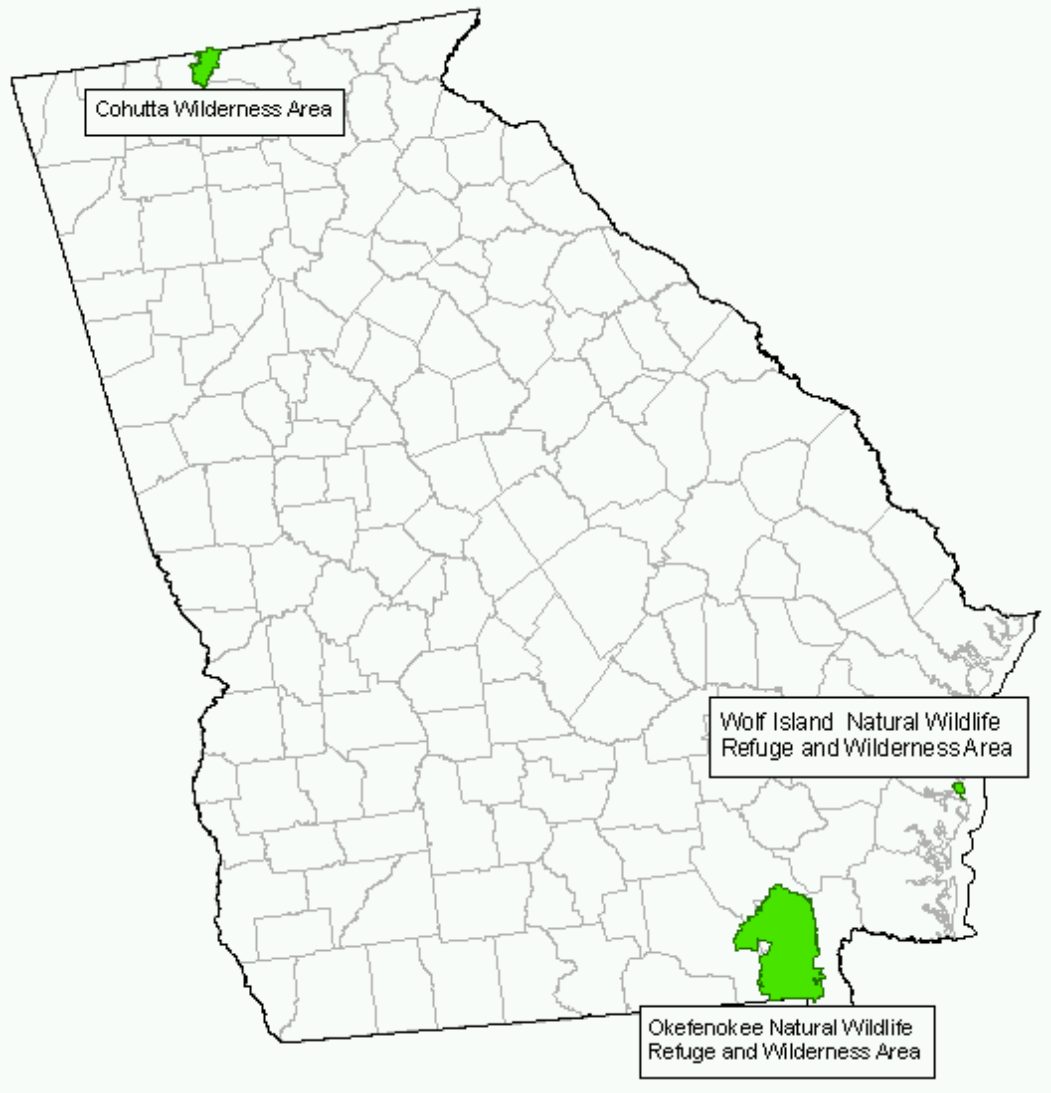


Figure 1-1. Georgia's Class I Areas

1.4 Light Extinction and Its Measurement

In Georgia's regional haze SIP, light extinction was the metric chosen to compare visibility impairment due to various sources. Light extinction is the fraction of source light lost per unit length along a sight path due to scattering and absorption by aerosols and scattering by gas molecules. Light extinction is measured indirectly using equipment in the Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring network – see Section 6. IMPROVE monitors measure PM_{10}, $PM_{2.5}$, and individual aerosol components. The aerosol component concentrations are multiplied by component-specific extinction factors to calculate the light extinction (in inverse megameters, Mm^{-1}) due to each of the following components:

- Ammonium sulfate
- Ammonium nitrate
- Particulate organic matter (POM)
- Elemental carbon (EC)
- Soil
- Sea salt
- Coarse mass (CM)

The total extinction (b_{ext}) is calculated from the IMPROVE equation, in which the component extinctions are added to extinction from Rayleigh scattering (caused by gas molecules) and nitrogen dioxide gas:

$$
\begin{aligned}
b_{ext} \approx\ & 2.2 \times f_S(RH) \times [\text{Small Sulfate}] + 4.8\, f_L(RH) \times [\text{Large Sulfate}] \\
& + 2.4 \times f_S(RH) \times [\text{Small Nitrate}] + 5.1\, f_L(RH) \times [\text{Large Nitrate}] \\
& + 2.8 \times [\text{Small Organic Mass}] + 6.1 \times [\text{Large Organic Mass}] \\
& + 10 \times [\text{Elemental Carbon}] \\
& + 1 \times [\text{Fine Soil}] \\
& + 1.7 \times f_{SS}(RH) \times [\text{Sea Salt}] \\
& + 0.6 \times [\text{Coarse Mass}] \\
& + 0.33 \times [NO_2(ppb)] \\
& + \text{Rayleigh Scattering (Site Specific)}
\end{aligned}
$$

The f(RH) factor is a function of relative humidity and is applied to aerosol species whose light extinction properties are affected by absorption of atmospheric moisture. For the purpose of reasonable progress goals at a Class I area, the total extinction is converted to units of deciviews (dV), a logarithmic form of inverse megameter units. For more information on light extinction and measurement, see Section 2 of the regional haze SIP .

1.5 Georgia's Long-term Strategy for Visibility Improvement

In Section 7.4 of Georgia's original regional haze SIP submittal, atmospheric ammonium sulfate was identified as the largest contributor to visibility impairment at the Georgia Class I areas during the

baseline period. Emissions sensitivity modeling (also in Section 7.4) performed for VISTAS determined that the most effective ways to reduce ammonium sulfate were to reduce SO_2 emissions from EGUs and, with an important but smaller impact, to reduce SO_2 emissions from non-utility industrial point sources. Therefore, SO_2 reductions from point sources were identified as the focus of Georgia's long-term strategy for visibility improvement.

Figure 1-2 shows the speciated average light extinction for the 20 percent worst days from 2006 through 2010 for Class I areas in the southeast and for additional areas bordering the southeast. Figure 1-3 shows the speciated average light extinction for the 20 percent best days from 2006 through 2010 for Class I areas in the southeast and for additional areas bordering the southeast.

Figures 1-4 and 1-5 show the speciated annual average light extinction for the 20 percent worst and best days for Okefenokee and Cohutta. The speciated annual average light extinction for the 20 percent worst and best days for the other sites in the southeast and additional areas bordering the southeast can be found in Appendix A. The speciated daily visibility impairment in VISTAS states' Class I areas from 2006-2010 can be found in Appendix B. These figures show that ammonium sulfate continues to be the major contributor to light extinction in Cohutta and Okefenokee, as well as in the other Class I areas in the southeast. Reduction of SO_2 emissions will therefore continue to be the focus of Georgia's long-term strategy for visibility improvement.

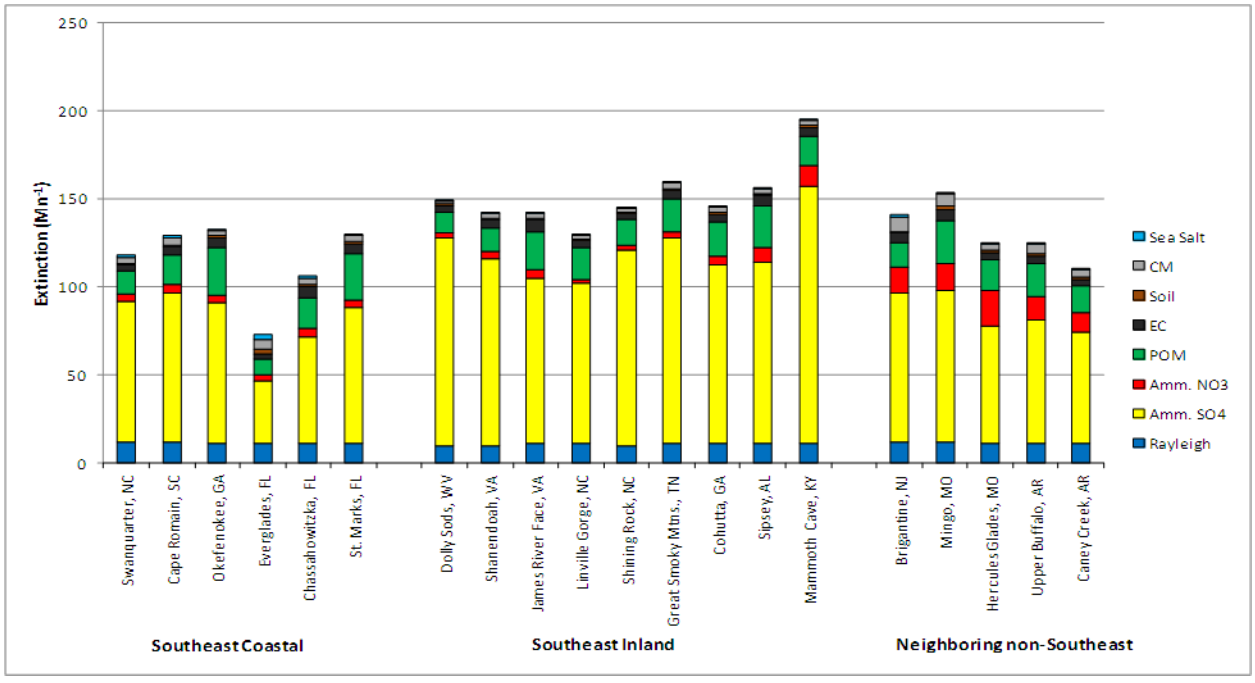


Figure 1-2. Average light extinction for the 20% worst visibility days in 2006-2010 at Southeast and neighboring Class I areas using the IMPROVE equation

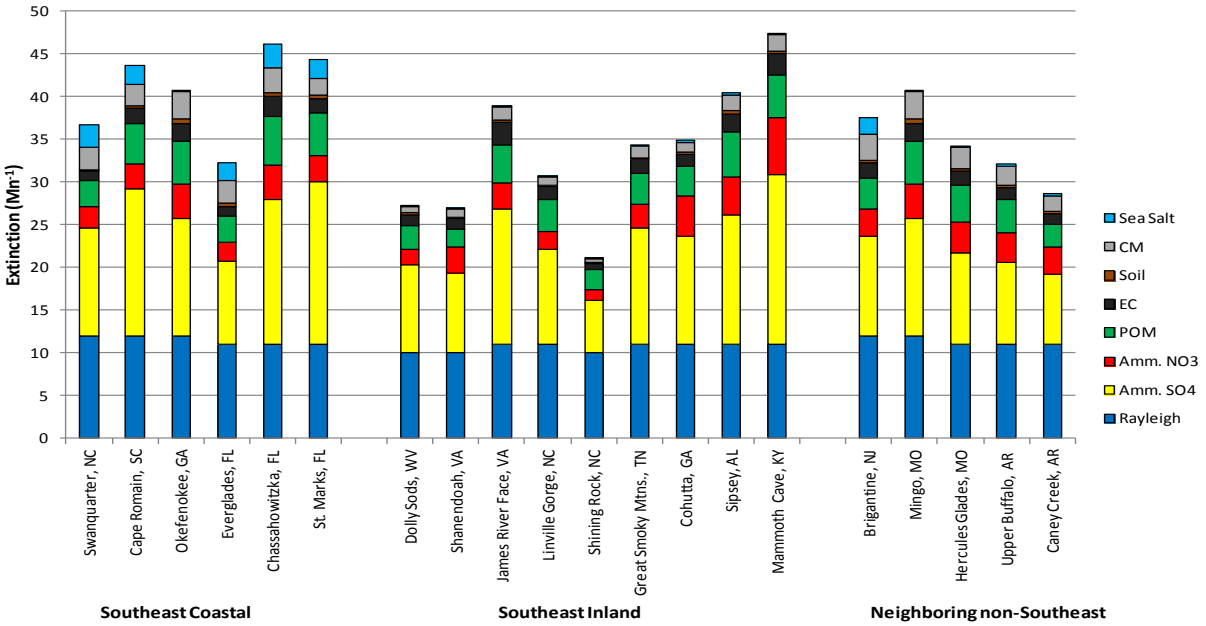


Figure 1-3. Average light extinction for the 20% best visibility days in 2006 - 2010 at Southeast and neighboring Class I areas using the IMPROVE equation

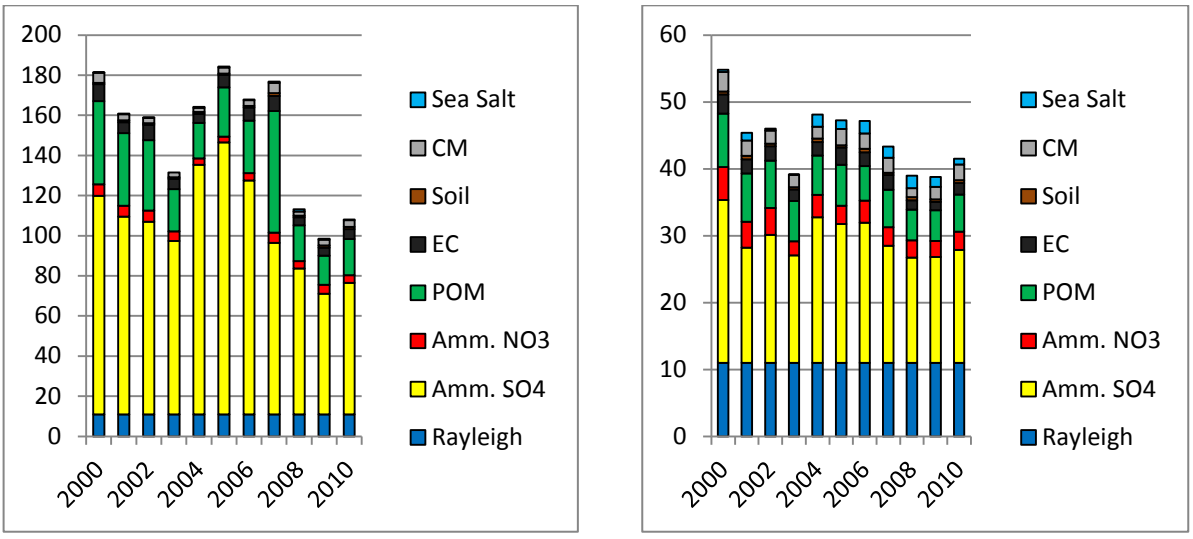


Figure 1-4. Annual average light extinction for the 20% worst visibility days (left) and the 20% cleanest visibility days (right) at Okefenokee.

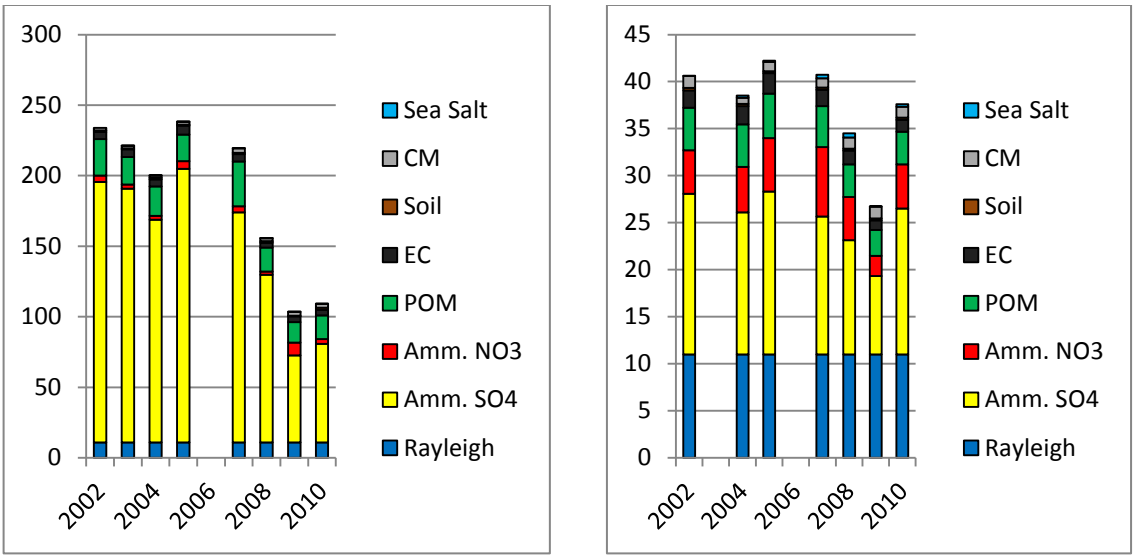


Figure 1-5. Annual average light extinction for the 20% worst visibility days (left) and the 20% best visibility days (right) at Cohutta.

1.6 2018 Reasonable Progress Goals for Georgia's Class I Areas

Table 1-2 shows the 2018 reasonable progress goals for Georgia's Class I areas on the 20 percent worst and the 20 percent best visibility days. When the five-year averages of the annual observed values for the period ending in 2018 are available, they will be compared to the 2018 goals. The reasonable progress goals for the 20% worst days were determined by modeling performed for the original regional haze SIP.

Table 1-2. 2018 Reasonable Progress Goals for Visibility Impairment in Georgia's Class I Areas

Class I Area	Baseline impairment (dv, 2000 – 2004 avg)	2018 reasonable progress goal (dv)	Natural background (dv)
20% Worst Days			
- Cohutta	30.25	22.78	10.78
- Okefenokee	27.13	23.77	11.21
- Wolf Island	27.13	23.77	11.21

20% Best Days			
- Cohutta	13.77	13.77 or less*	4.32
- Okefenokee	15.23	15.23 or less*	5.31
- Wolf Island	15.23	15.23 or less*	5.31

* The regional haze requirement for the 20% best days is to maintain the visibility impairment at or below the baseline impairment.

1.7 Periodic Progress Report

The requirements for periodic reports are outlined in 40 CFR 51.308(g). Each state must submit a report to the USEPA every five years evaluating the progress towards the reasonable progress goal for each Class I area located within the state and in each Class I area located outside the state which may be affected by emissions from within the state. The progress report must be a formal SIP submittal and at a minimum, must contain the following elements:

(1) A description of the status of implementation of all measures included in the SIP for achieving reasonable progress goals for Class I areas both within and outside the State.

(2) A summary of the emission reductions achieved throughout the State through implementation of the measures described in (1) above.

(3) For each Class I area within the State, the State must assess the following visibility conditions and changes, with values for most impaired and least impaired days expressed in terms of five-year averages of these annual values

(i) The current visibility conditions for the most impaired and least impaired days;

(ii) The difference between current visibility conditions for the most impaired and least impaired days and baseline visibility conditions;

(iii) The change in visibility impairment for the most impaired and least impaired days over the past 5 years;

(4) An analysis tracking the change over the past 5 years in emissions of pollutants contributing to visibility impairment from all sources and activities within the state. Emissions changes should be identified by type of source or activity. The analysis must be based on the most recently updated emissions inventory, with estimates projected forward as necessary and appropriate, to account for emissions changes during the applicable 5-year period.

(5) An assessment of any significant changes in anthropogenic emissions within or outside the State that have occurred over the past 5 years that have limited or impeded progress in reducing pollutant emissions and improving visibility.

(6) An assessment of whether the current SIP elements and strategies are sufficient to enable the State, or other states with Class I areas affected by emissions from the State, to meet all established reasonable progress goals.

(7) A review of the state's visibility monitoring strategy and any modifications to the strategy as necessary.

This periodic progress report addresses the progress made toward Georgia's 2018 goals. The progress report requirements are addressed in the following sections.

2.0 Status of Implementation of Control Measures

This section provides the status of implementation of the emission reduction measures that were included in the original regional haze SIP, as required by 40 CFR 51.308(g)(1). These measures include Federal programs, State requirements for EGUs, and State requirements for non-EGU point sources. The quantity of SO_2 reductions achieved through 2009 from the State measures is estimated, as required by 40 CFR 51.308(g)(2).

This section also describes other strategies that were not included in the regional haze SIP. At the time of the best and final inventory development process, these measures were not fully documented or had not yet been published in final form, and therefore the benefits of these measures were not included in future year inventories. Emission reductions from these measures will help ensure that each Class I area meets or exceeds the visibility progress goal set in the regional haze SIP.

2.1 Emissions Reduction Measures Included in the Regional Haze SIP

Georgia's original regional haze SIP included the following types of measures for achieving reasonable progress goals:

- Federal programs
- State EGU control measures
- State reasonable progress and BART control measures

These emissions reduction strategies were included as inputs to the VISTAS final modeling. The current status of the implementation of these measures is summarized in the following paragraphs and an estimate of the SO_2 emissions reductions achieved is presented.

2.1.1 Federal Programs

The emissions reductions associated with the Federal programs that are described in the following paragraphs were included in the VISTAS future year emissions estimates. Descriptions contain qualitative assessments of emissions reductions associated with each program, and where possible, quantitative assessments. In cases where delays or modification have altered emissions reduction estimates such that the original estimates of emissions are no longer accurate, information is also provided on the effects of these alterations.

Clean Air Interstate Rule

On May 12, 2005, EPA promulgated the Clean Air Interstate Rule (CAIR), which required reductions in emissions of NO_x and SO_2 from large EGUs fired by fossil fuels. These emission reductions were included as part of Georgia's regional haze SIP. In large part the SO_2 reductions expected from CAIR are duplicative of the reductions associated with Georgia's Multipollutant rule, which is discussed later in this report. The SO_2 reductions from the baseline expected from CAIR and the Multipolluant rule in combination were approximately 200,000 tons/yr by 2009 and over 500,000 tons/yr by 2018.

After a petition for review of the CAIR, the U.S. Court of Appeals for the D.C, Circuit issued a decision in 2008 that vacated and remanded these rules to EPA. However, parties to the litigation

requested rehearing of aspects of the Court's decision, including the vacatur of the rules. On December 23, 2008, the Court granted rehearing only to the extent that it remanded the rules to EPA without vacating them. This ruling left CAIR in place with a requirement for EPA to issue a new rule that would correct the problems identified by the Court.

On July 6, 2011, EPA finalized the Cross-State Air Pollution Rule (CSAPR), which would have replaced CAIR beginning in 2012. However, CSAPR was challenged and the U.S. Court of Appeals for the D.C. Circuit issued a decision on August 21, 2012, vacating the new rule. The Court directed EPA to continue implementing CAIR while it continues to work on a replacement rule. EPA's petition for a rehearing by the full Court was denied. On March 29, 2013 the U.S. Solicitor General petitioned the Supreme Court to review the D.C. Circuit Court's decision on CSAPR. That request is still pending.

2007 Heavy-Duty Highway Rule (40 CFR Part 86, Subpart P)

In this regulation, EPA set a particulate matter (PM) emissions standard for new heavy-duty engines of 0.01 gram per brake horsepower-hour (g/bhp-hr), which took full effect for diesel engines in the 2007 model year. This rule also included standards for nitrogen oxides (NO_x) and non-methane hydrocarbons (NMHC) of 0.20 g/bhp-hr and 0.14 g/bhp-hr, respectively. These diesel engine NO_x and NMHC standards were successfully phased in together between 2007 and 2010. The rule also required that sulfur in diesel fuel be reduced to facilitate the use of modern pollution-control technology on these trucks and buses. EPA required a 97 percent reduction in the sulfur content of highway diesel fuel, from levels of 500 parts per million (ppm) (low sulfur diesel) to 15 ppm (ultra-low sulfur diesel). These requirements were successfully implemented on the timeline in the regulation.

Tier 2 Vehicle and Gasoline Sulfur Program (40 CFR Part 80 Subpart H; Part 85; Part 86)

EPA's Tier 2 fleet averaging program for on-road vehicles, modeled after the California Low Emission Vehicle (LEV) II standards, became effective in the 2005 model year. The Tier 2 program allows manufacturers to produce vehicles with emissions ranging from relatively dirty to very clean, but the mix of vehicles a manufacturer sells each year must have average NO_X emissions below a specified value. Mobile emissions continue to be reduced by this program as motorists replace older, more polluting vehicles with cleaner vehicles.

Nonroad Mobile Diesel Emissions Program (40 CFR Part 89)

EPA adopted standards for emissions of NOx, hydrocarbons, and carbon monoxide (CO) from several groups of nonroad engines, including industrial spark-ignition engines and recreational nonroad vehicles. Industrial spark-ignition engines power commercial and industrial applications and include forklifts, electric generators, airport baggage transport vehicles, and a variety of farm and construction applications. Nonroad recreational vehicles include snowmobiles, off-highway motorcycles, and all-terrain vehicles. These rules were initially effective in 2004 and were fully phased in by 2012. Nonroad Mobile emissions continue to benefit from this program as motorists replace older, more polluting nonroad vehicles with cleaner vehicles.

The nonroad diesel rule set standards that reduced emissions by more than 90 percent from nonroad diesel equipment and, beginning in 2007, the rule reduced fuel sulfur levels by 99 percent from previous levels. The reduction in fuel sulfur levels applied to most nonroad diesel fuel in 2010 and applied to fuel used in locomotives and marine vessels in 2012.

Maximum Achievable Control Technology Programs (40 CFR Part 63)

VISTAS applied controls to future year emissions estimates from various maximum achievable control technology (MACT) regulations for volatile organic compounds (VOC), SO_2, NO_x, and PM on source categories where controls were installed on or after 2002. Control estimates are documented in the report entitled, "Control Packet Development and Data Sources", Alpine Geophysics, July 14, 2004. Table 2-1 describes the MACTs used as control strategies for the non-electric generating units point source emissions. The table notes the pollutants for which controls were applied as well as the promulgation dates and the compliance dates for existing sources. Rules that reduced emissions of volatile organic compounds (VOCs) are not included as anthropogenic VOCs do not make a significant contribution to visibility impairment.

Table 2-1. MACT source categories with compliance dates on or after 2002

MACT Source Category	40CFR63 Subpart	Promulg. Date	Compliance Date (Existing Sources)	Pollutants Affected
Hazardous Waste Combustion (Phase I)	63(EEE), 261 and 270	9/30/99	9/30/03	PM
Portland Cement Manufacturing	LLL	6/14/99	6/10/02	PM
Secondary Aluminum Production	RRR	3/23/00	3/24/03	PM
Lime Manufacturing	AAAAA	1/5/04	1/5/07	PM, SO_2
Taconite Iron Ore Processing	RRRRR	10/30/03	10/30/06	PM, SO_2
Industrial Boilers, Institutional/ Commercial Boilers and Process Heaters	DDDDD	1/31/13	1/31/16	PM, SO_2
Reciprocating Internal Combustion Engines	ZZZZ	6/15/04	6/15/07	NO_X, VOC

Use of the Industrial/Commercial/Institutional (ICI) boiler MACT standard (40 CFR 63 Subpart DDDDD) was problematic in that the U.S. Court of Appeals vacated and remanded the regulation to EPA on June 8, 2007. However, VISTAS chose to leave the emissions reductions associated with this regulation in place since the Clean Air Act required use of alternative control methodologies under Section 112(j) for uncontrolled source categories. The applied MACT control efficiencies were 4 percent for SO_2 and 40 percent for coarse particulate matter (PM_{10}) and fine particulate matter

($PM_{2.5}$) to account for the co-benefit from installation of acid gas scrubbers and other control equipment to reduce hazardous air pollutants (HAPs).

The Georgia emissions reductions that were modeled to account for the ICI boiler MACT were 1,344 tons/year of SO_2, 879 tons/year of $PM_{2.5}$, and 1,304 tons/year of PM_{10}. These reductions are insignificant (0.69% for SO_2, 0.39% for $PM_{2.5}$, and 0.13% for PM_{10}) compared to the projected 2018 statewide total emissions and therefore the absence of the reductions would not impact the conclusions made in the SIP.

EPA finalized the revised ICI Boiler MACT on February 21, 2011. However, EPA subsequently reconsidered certain aspects of the rule and proposed changes on December 2, 2011. The final rulemaking was published on December 20, 2012. The final compliance date for ICI boilers at major sources is 2016 with the option to request an additional year. EPA's estimate of nationwide SO_2 emissions reductions under the 2012 final rule is over 500,000 tons/year, as compared to an estimate of 113,000 tons/year in the analysis for the 2004 rule (78 FR 7138 and 69 FR 55218). Therefore it is reasonable to expect that the 2012 rule will bring about more SO_2 reductions in Georgia than were modeled in Georgia's regional haze SIP. The effects of the new rule will be addressed in the 2018 revision to the regional haze SIP.

2.1.2 State EGU Control Measures

Emissions from electric generating units (EGUs) have been regulated through state measures in North Carolina and Georgia. Reductions associated with these measures were used to estimate the 2018 visibility improvements at the VISTAS Class I areas.

North Carolina Clean Smokestacks Act

In June of 2002, the North Carolina General Assembly enacted the Clean Smokestacks Act (CSA), which required significant actual emissions reductions from coal-fired power plants in North Carolina. These reductions were included as part of the VISTAS 2018 Best and Final modeling effort. Under the act, power plants were required to reduce their NO_x emissions by 77% in 2009 and their SO_2 emission by 73% in 2013. Actions taken to date by facilities subject to these requirements comply with the provisions of the CSA, and compliance plans and schedules will allow these entities to achieve the emissions limitations set out by the Act. This program has been highly successful. In 2009, regulated entities emitted less than the 2013 system annual cap of 250,000 tons of SO_2 and less than the 2009 system annual cap of 56,000 tons of NO_x. In 2002, the sources subject to CSA emitted 459,643 tons of SO_2 and 142,770 tons of NO_x. In 2011, these sources emitted only 73,454 tons of SO_2 and 39,284 tons of NO_x, well below the Act's system caps.

Georgia Multi-Pollutant Control for Electric Utility Steam Generating Units

Georgia rule 391-3-1.02(2)(sss), enacted in 2007, requires flue-gas desulphurization (FGD) and selective catalytic reduction (SCR) controls on large coal-fired EGUs in Georgia. Reductions from this regulation were included as part of the VISTAS 2018 best and final modeling effort. These controls will reduce SO_2 emissions from the affected emissions units by at least 95 percent and will reduce NO_x emissions by approximately 85 percent. Control implementation dates vary by EGU, starting with December 31, 2008 and ending with December 31, 2015.

Table 2-2 lists coal-fired EGU sources which were scheduled to add SO_2 controls at the time of the original SIP submittal. The table shows the planned controls for each of the affected units and the current status of those controls. To date, all planned controls have been implemented either early or

on time and the State rule requirements for controls in 2013 or later are still in place. In the case of Plant McDonough, Georgia Power elected to retire Units 1 and 2 prior to their control dates. Amendments to rule 391-3-1.02 (sss) after the Regional Haze SIP was submitted will affect SO_2 emissions from Plant Branch in two ways. First, a combined emissions cap was placed on Units 3 and 4 for the years 2014 through 2016. Second, SO_2 control schedules for Units 1, 3, and 4 were moved to align the schedules with the MATS rule compliance date of April 15, 2015. The net effect of these changes should be a decrease in Branch's total SO_2 emissions for the period 2014 through 2015 (increase in 2014 but a larger decrease in 2015) compared to the base case (original SIP projections). After 2015 there should be no change from the base case.

The estimated total of all planned reduction measures is 441,989 tons/yr (2018 tons versus 2002 tons) and the estimated total of these reduction measures implemented through 2009 is 184,215 tons/yr, or 40% of the 2018 total. The amount of SO_2 reduction measures implemented through 2009 is approximately 20,000 tons more than expected due to early implementation of controls for Wansley Unit 2. Another 93,000 tons of SO_2 reduction measures is estimated to have been implemented from 2010 through 2012. These estimates are based on projections and assumed control efficiencies documented in the original SIP rather than actual emissions. Actual reductions from all sources will be presented in the emissions inventory section of this report (see Section 4).

Table 2-2 shows for each of the subject emissions units any Class I areas in neighboring states on which the source is believed to have a significant visibility impact due to its SO_2 emissions. The threshold adopted by Georgia for a significant visibility impact is 0.5 percent or more of sulfate visibility impairment. The threshold and the calculated impacts of individual point sources are documented in the area of influence analysis in the original regional haze SIP. The control measures for all of the subject sources with significant impacts on Class I areas in neighboring states are scheduled for implementation not later than June 2015. The majority of these controls will be implemented by December 2013.

The Georgia Public Service Commission has approved requests from Georgia Power to retire a number of coal-fired EGUs and to convert two coal-fired units to gas combustion. The group of units scheduled for retirement/fuel switching includes some units with required SO_2 controls under Rule (sss). See Section 2.2.4 for more discussion.

Table 2-2. SO_2 Control Measures for Georgia EGUs: Status of Implementation

Facility	Emiss. Unit	Emissions Control Measure	Estimated SO_2 Reductions, 2002 to 2018 (tons)[1]	Required Control Date (GA rule)[2]	Status of Implementation	Impacted Class I Areas in Neighboring States[3]
Hammond	1	FGD	3,664	12/31/2008	Completed early 5/1/2008	None > 0.5 %
	2	FGD	3,822	12/31/2008	Completed early 5/1/2008	None > 0.5 %
	3	FGD	3,995	12/31/2008	Completed early 5/1/2008	None > 0.5 %
	4	FGD	16,360	12/31/2008	Completed early 5/1/2008	J. Kilmer (NC)
Wansley	1	FGD	35,723	12/01/2008	Completed on schedule	None > 0.5 %
	2	FGD	33,399	12/31/2009	Completed early 5/1/2009	None > 0.5 %
Bowen	1	FGD	30,635	06/01/2010	Completed on schedule	J. Kilmer (NC)
	2	FGD	32,834	06/01/2009	Completed on schedule	J. Kilmer (NC)
	3	FGD	39,844	12/31/2008	Completed on schedule	J. Kilmer (NC)
	4	FGD	39,487	12/31/2008	Completed on schedule	J. Kilmer (NC)
McDonough	1	FGD	13,224	04/30/2012	Unit shut down prior to required control date	None > 0.5 %
	2	FGD	13,035	12/31/2011	Unit shut down prior to required control date	None > 0.5 %

Facility	Emiss. Unit	Emissions Control Measure	Estimated SO_2 Reductions, 2002 to 2018 (tons)[1]	Required Control Date (GA rule) [2]	Status of Implementation	Impacted Class I Areas in Neighboring States[3]
Scherer	1	FGD	23,973	12/31/2014	Expect to complete on schedule	J. Kilmer (NC) Shining Rock (NC) G. Smoky Mtns. (NC/TN) Sipsey (AL)
	2	FGD	23,662	12/31/2013	Expect to complete on schedule	J. Kilmer (NC) Shining Rock (NC) G. Smoky Mtns. (NC/TN) Sipsey (AL)
	3	FGD	16,762	07/01/2011	Implemented on Schedule	J. Kilmer (NC) Shining Rock (NC) G. Smoky Mtns. (NC/TN) Sipsey (AL)
	4	FGD	19,440	12/31/2012	Implemented on Schedule	J. Kilmer (NC) Shining Rock (NC) G. Smoky Mtns. (NC/TN) Sipsey (AL)
Branch	1	FGD	10,219	12/31/2013	Rule (sss) compliance date revised to 4/16/2015 to coincide with MATS. GA Power's request to shut down in 2015 is approved.	None > 0.5 %
	2	FGD	13,193	10/01/2013	GA Power's request to shut down in 2013 is approved.	None > 0.5 %
	3	FGD	20,053	10/01/2015	Rule (sss) compliance date revised to 4/16/2015 to	None > 0.5 %

Facility	Emiss. Unit	Emissions Control Measure	Estimated SO_2 Reductions, 2002 to 2018 (tons)[1]	Required Control Date (GA rule) [2]	Status of Implementation	Impacted Class I Areas in Neighboring States[3]
					coincide with MATS. GA Power's request to shut down in 2015 is approved.	
	4	FGD	21,209	12/31/2015	Rule (sss) compliance date revised to 4/16/2015 to coincide with MATS. GA Power's request to shut down in 2015 is approved.	None > 0.5 %
Yates	1	FGD	-99	12/31/2008	FGD installed prior to RH baseline; GA Power's request to shut down in 2015 is approved.	None > 0.5 %
	6	FGD	14,357	06/01/2015	Rule (sss) compliance date revised to 4/16/2015 to coincide with MATS. GA Power's request to switch to natural gas by 2015 is approved.	J. Kilmer (NC) Shining Rock (NC) G. Smoky Mtns. (NC/TN) Sipsey (AL)
	7	FGD	13,198	06/01/2015	Rule (sss) compliance date revised to 4/16/2015 to coincide with MATS. GA Power's request to switch to natural gas by 2015 is approved.	J. Kilmer (NC) Shining Rock (NC) G. Smoky Mtns. (NC/TN) Sipsey (AL)

Facility	Emiss. Unit	Emissions Control Measure	Estimated SO_2 Reductions, 2002 to 2018 (tons)[1]	Required Control Date (GA rule) [2]	Status of Implementation	Impacted Class I Areas in Neighboring States[3]
TOTAL - all reductions			441,989			
measures implemented through 2009			184,215			
measures expected through 2009			161,949			

(1) Source: Georgia's regional haze SIP submittal, Appendix H.3. Reductions were calculated as 2002 emissions versus 2018 emissions that were projected in the regional haze SIP. 2018 emissions reflect projected demand growth from 2002 and 95% control.

(2) All Georgia EGU controls are required by the Georgia Multipollutant Rule (391-3-1-.02(2)(sss)), which supports CAIR

(3) Contribution of source's emissions to 2018 total sulfate visibility impact on Class I area is 0.5 % or more. See Section 10.0 of the Regional Haze SIP for more details.

2.1.3 Georgia Reasonable Progress and BART Control Measures

In preparation of the original regional haze SIP, Georgia identified a number of non-EGU industrial facilities, based on their SO_2 emissions and proximity, with the potential to impact visibility in the State's Class I areas. Four-factor analyses were performed to identify the feasibility and appropriateness of control measures for the furthering of reasonable progress towards background visibility. In addition, BART determinations were performed for several subject-to-BART sources.

Table 2-3 lists facilities at which control measures were ultimately required, the affected units, the control measures, and the current status of implementation. The estimated total of all reductions required before 2018 is 8,223 tons. None of the reductions were required through calendar year 2009. To date, the control measures at Brunswick Cellulose (Georgia Pacific), Packaging Corporation of America, and Interstate Paper have been implemented and verified through record review. All future controls requirements are still in place.

Table 2-3 shows for each of the subject sources any Class I areas in neighboring states on which the source is believed to have a significant visibility impact due to its SO_2 emissions. The threshold adopted by Georgia for a significant visibility impact is 0.5 percent or more of sulfate visibility impairment and is documented in the original regional haze SIP. The permit limit for Georgia Pacific's Cedar Springs facility is already in place. The permit limit for International Paper will be effective in 2016.

Table 2-3. Summary of SO_2 SIP Controls for non-EGUs in Georgia

Facility	Emissions Unit	Emission Controls Included in SIP	Estimated Tons Reduced	Required Control Date	Status of Controls[1]	Impacted Class I Areas in Neighboring States[2]
GA Pacific – Brunswick Cellulose	F1 Pwr. Boiler 4	Permit limit of 568 tpy of SO_2	1074	January 1, 2012	Permit condition in place; 2012 SO_2 emissions = 142 tons	None > 0.5 %
Georgia Pacific – Cedar Springs	Power Boiler U500	Permit limit of 135 pound SO_2 per hour (same as BART exemption modeling limit)	1385	Upon Completion of BART exemption project	Required for BART exemption. BART project was completed on July 31, 2011. The facility performed an initial compliance test and passed.	St. Marks (FL)
	Power Boiler U501	Permit limit of 135 pound SO_2 per hour (same as BART exemption modeling limit)	1385			St. Marks (FL)
International Paper – Savannah	Pwr. Boiler 13, including combustion of process organic emissions	Permit limit of 6578 tpy of SO_2	2000	January 1, 2016	Permit condition in place to meet the scheduled control date (Permit No. 2631-051-0007-V-02-0)	Swanquarter (NC) C. Romain (SC) St. Marks (FL)
Packaging Corp. of America	CE Power Boiler	Permit limit of 600 tpy of SO_2	53	January 1, 2012	Permit condition in place; 2012 SO_2 emissions = 1.3 tons	None > 0.5 %

Facility	Emissions Unit	Emission Controls Included in SIP	Estimated Tons Reduced	Required Control Date	Status of Controls[1]	Impacted Class I Areas in Neighboring States[2]
Rayonier Perf. Fibers	PB02 Pwr. Boiler 2	Permit limit of 318 tons SO_2 per 12 consecutive months, compliance date of June 4, 2008	306	January 1, 2018	Permit condition in place to limit No. 6 & No. 2 oil to 7.4235 and 1.30305 MMgal/yr respectively (Permit No. 2631-305-0001-V-03-0)	None > 0.5 %
	PB03 Pwr. Boiler 3	Permit limit of 149 tons SO_2 per 12 consecutive months, compliance date of June 4, 2008	1448	January 1, 2018	Permit condition in place (Permit No. 2631-305-0001-V-03-0)	None > 0.5 %
	RF01 No. 5 Rec. Furn.	Permit limit of 194 tons SO_2 per 12 consecutive months, compliance date tied to facility modification	139	January 1, 2018	Permit condition in place to meet the limit once the construction and conversion project is completed (Permit No. 2631-305-0001-V-03-0)	None > 0.5 %
	RF04 No. 6 Rec. Furn.	Permit limit of 307 tons SO_2 per 12 consecutive months, compliance date tied to facility modification	27	January 1, 2018	Permit condition in place to meet the limit once the construction and conversion project is completed (Permit No. 2631-305-0001-V-03-0)	None > 0.5 %

Facility	Emissions Unit	Emission Controls Included in SIP	Estimated Tons Reduced	Required Control Date	Status of Controls[1]	Impacted Class I Areas in Neighboring States[2]
Southern States Phosphate and Fertilizer	SA02 Acid Plant 2	Permit limit of 580 tpy of SO_2	228	January 1, 2014	Permit condition in place to meet the scheduled control date (Permit No. 2819-051-0077-V-02-1)	None > 0.5 %
Interstate Paper	Power Boiler	Burn natural gas except during curtailment	178	January 1, 2012	Required by BART determination. Permit condition in place; in 2012 burned oil during Q2 curtailment, burned nat. gas for balance of year	None > 0.5 %
TOTAL of all reductions			8,223			

(1) Control for GA Pacific Cedar Springs was required for BART exemption. Control for Interstate Paper was required for BART determination. All other controls were required to meet Regional Haze Reasonable Progress (as determined by Four-Factor Analysis).

(2) Contribution of source's emissions to 2018 total sulfate visibility impact on Class I area is 0.5 % or more. See Section 10.0 of the Regional Haze SIP for more details.

2.2 Emission Reduction Measures Not Included in the Regional Haze SIP

Since development of the 2018 Best and Final inventory effort, a number of regulations and requirements have been promulgated that were not included in Georgia's original SIP submittal. The sections below provide information on these requirements, and, where possible, estimates of additional reductions are provided. These reductions provide extra assurances that the VISTAS Class I areas will meet their reasonable progress goals in a timely manner.

2.2.1 North American Emission Control Area

On March 26, 2010, the International Maritime Organization officially designated waters off North American coasts as an area in which stringent international emission standards will apply to ships. These standards will reduce air pollution from ships and deliver air quality benefits that extend hundreds of miles inland. In 2020, the USEPA expects emissions from ships operating in the designated area to be reduced by 320,000 tons for NO_X, 90,000 tons for $PM_{2.5}$, and 920,000 tons for SO_2, which is 23 percent, 74 percent, and 86 percent, respectively, below predicted levels in 2020 absent the Emissions Control Area designation.

Implementation of the Emission Control Area means that ships entering the designated area would need to use compliant fuel for the duration of their voyage that is within that area, including time in port as well as voyages whose routes pass through the area without calling on a port. The requirements for quality of fuel change over time. From the effective date in 2012 until 2015, fuel used by all vessels operating in designated areas cannot exceed 10,000 ppm sulfur content. Beginning in 2015, fuel used by vessels operating in these areas cannot exceed 1,000 ppm sulfur content, and beginning in 2016, NO_X after-treatment requirements become applicable.

2.2.2 Residual Risk Requirements

The Clean Air Act requires the USEPA to assess the risk remaining after application of final technology-based air toxics standards to any source category within 8 years of setting the technology based MACT standards. In the residual risk process, the USEPA must assess the remaining health risks from each source category to determine whether the MACT standards provide an ample margin of safety to protect public health and protect against adverse environmental effects. Final rules for this Clean Air Act requirement are expected for 28 source categories between 2011 and 2013. Additional requirements to reduce toxic air emissions under the residual risk assessment may also have co-benefits for the reduction of VOC and other criteria pollutant emissions between now and 2018.

2.2.3 New EGU Control Strategies

Two federal programs and one federal consent agreement will provide further reductions in SO_2 from the EGU source sector, either as a result of SO_2 requirements or as co-benefit from the reduction of HAPs. These benefits were not considered in the development of the VISTAS Best and Final 2018 inventories. Any additional SO_2 emission reduction benefits achieved by the implementation of these requirements will help to ensure that all Class I areas in VISTAS meet their reasonable progress goals in a timely manner.

Mercury and Air Toxics Rule

On December 16, 2011, the USEPA finalized national CAA standards to reduce mercury and other toxic air pollution from coal and oil-fired power plants. The final rule established power plant emission standards for mercury, acid gases, and non-mercury metallic toxic pollutants that will prevent 90 percent of the mercury in coal burned in power plants from being emitted to the air; reduce by 88 percent the acid gas emissions from power plants; and cut power plant SO_2 emissions by 41 percent beyond the reductions originally expected from CSAPR. These reductions are expected in the 2016 time frame.

2010 SO_2 NAAQS

On June 2, 2010, the USEPA strengthened the primary NAAQS for SO_2 by revising the primary SO_2 standard to 75 parts per billion (ppb) averaged over one hour. This short term standard is significantly more stringent than the revoked standards of 140 ppb averaged over 24 hours and 30 ppb averaged annually. Under the new standard, facilities with significant emissions of SO_2, many of which are EGUs, may be required to demonstrate compliance with the standard no later than 2017.

Tennessee Valley Authority Federal Consent Agreement

In April of 2011, the USEPA announced a settlement with the Tennessee Valley Authority (TVA) to resolve alleged Clean Air Act violations at 11 of its coal-fired plants in Alabama, Kentucky, and Tennessee. The settlement requires TVA to invest $3 billion to $5 billion on new and upgraded state-of-the-art pollution controls. Once fully implemented, the pollution controls and other required actions will address 92 percent of TVA's coal-fired power plant capacity, reducing emissions of NO_X by 69 percent and SO_2 by 67 percent from TVA's 2008 emissions levels.

2.2.4 Georgia Power EGU Retirements and Fuel Conversions

In 2011 Georgia Power Company filed a request to Georgia's Public Service Commission (PSC) to retire Plant Branch's Units 1 and 2 in the year 2013. The PSC approved the request in March 2012. Closure of these 2 units will bring about SO_2 emissions reductions beyond what would have been accomplished with their continued operation with SO_2 controls.

In January of 2013 Georgia Power filed a request to the PSC for the decertification and retirement of 15 fossil fuel EGUs totaling 2061 MW of generating capacity (Appendix C). The requested closures included the following:

- 10 coal-fired units
- 3 oil-fired units
- 2 gas-fired units (combustion turbines)

The company also requested the conversion of two units from coal combustion to gas combustion and a delay of the closure of Plant Branch Unit 1 until 2015. The two conversions and the majority of the retirements will occur by April 2015 and all of the retirements will occur by April 2016. The PSC approved Georgia Power's request on July 11, 2013 (Appendix C).

The loss in generation capacity associated with the retirements will be made up by bringing two additional nuclear units online at Plant Vogtle. These units are expected to be online in 2017 or later. Five of the coal-fired units whose closure/conversion was part of the January 2013 request had been required by State rule to install sulfur dioxide controls (FGD) in the future when the original regional haze SIP was submitted to EPA (see Table 2-2). Closure/conversion of these five units will bring

about SO_2 emissions reductions beyond what would have been accomplished with continued operation with SO_2 controls. Closure of the other 5 coal-fired units and the 3 oil-fired units will also bring about SO_2 reductions beyond what was modeled in the regional haze SIP.

2.3 Summary of SO_2 Emissions Reductions through 2009

SO_2 emissions reduction measures from Georgia sources that are readily quantifiable are the reductions from EGU point sources with controls required by Georgia's Multipollutant Rule (391-3-1-.02(2)(sss)) and the reductions from non-EGU point sources with emissions limits required by the regional haze SIP (from reasonable progress and BART determinations). As discussed previously, none of the SO_2 limits required for the non-EGU sources became effective before the end of 2009 and none had been implemented at that time. The estimated total reduction expected from control measures for non-EGUs by 2018 is 8,223 tons. The estimated total of SO_2 reduction measures (on 2018 basis) implemented with new EGU controls through 2009 is 184,215 tons/yr. This is approximately 20,000 tons more than expected at that milestone due to early implementation of controls for Wansley Unit 2. A total of 441,989 tons of SO_2 reduction measures is expected from the requirements of the Multipollutant rule by 2018. Additional SO_2 reductions are expected by 2016 due to retirement and fuel-switching of coal-fired EGUs announced in 2013 by Georgia Power.

Table 2-4 summarizes the quantities of reduction measures implemented and expected through 2009 and expected through 2018. The quantity of reductions implemented is the sum of estimated (calculated) reductions for measures implemented rather than actual emissions, which will be discussed in the inventory section.

Table 2-4. Status of Regional Haze SIP SO_2 Reduction Measures (tons/year)

Requirement	Reduction measures implemented through 2009	Reduction measures expected through 2009	Reduction measures expected through 2018
GA Multipollutant rule for EGUs	184,215	161,949	441,989
RH SIP emissions limits on non-EGU point sources	0	0	8,223
TOTAL	184,215	161,949	450,212

3.0 Visibility Conditions

Section 51.308(g)(3) requires the State to assess the visibility conditions for the most impaired and least impaired days expressed in terms of five-year averages. The visibility conditions that must be reviewed include 1) the current visibility conditions, 2) the difference between current visibility conditions compared to the baseline, and 3) the change in visibility impairment for the most and least impaired days over the past 5 years.

Table 3-1 shows the current visibility conditions and the difference between the current visibility and the baseline condition expressed in terms of 5-year averages of observed visibility impairment. The baseline conditions are for 2000 through 2004 and the current conditions are for 2006 through 2010. Wolf Island does not have a monitor so the Okefenokee visibility data is used for this Class I area. The data shows that all Class I areas saw an improvement in visibility (i.e., reduced impairment) on the 20% worst days and on the 20% best days. For the 20% worst days, the current observed values for all three areas are below the 2010 interpolations of both the glide slope and the predicted values. For the 20% best days, the current observed values for all three areas are below the 2010 interpolations of the predicted values (reasonable progress goals).

Table 3-1. Current Observed Visibility Impairment and Change from Baseline (five-year averages and 2010 annual values in deciviews)

Class I Area	Baseline avg. (2000 - 2004)	2010** glide slope	2010** predicted (r. prog.)	Current avg. (2006 - 2010)	Change (current - baseline)	2010 observed annual
20% Worst Days						
- Cohutta*	30.25	28.31	26.58	26.18	-4.07	23.83
- Okefenokee	27.13	25.54	25.20	25.01	-2.13	23.60
- Wolf Island	27.13	25.54	25.20	25.01	-2.13	23.60
20% Best Days						
- Cohutta*	13.77	na	12.87	12.18	-1.59	13.01
- Okefenokee	15.23	na	14.21	14.19	-1.04	14.13
- Wolf Island	15.23	na	14.21	14.19	-1.04	14.13

* No annual average for years 2000 and 2006

** Interpolated between 2009 and 2018 values presented in the regional haze SIP submittal. Predicted value is interpolation of the reasonable progress goal.

Table 3-2 displays the change in visibility impairment for the 20% most and 20% least impaired days over the past 5 years in terms of the five-year averages. The data shows that all three Class I areas saw an improvement in visibility on the 20% worst days and on the 20% best days. Impairment was fairly flat for the years 2005-2007 but then dropped steadily from 2008-2010. This trend coincides with the onset of installation of SO_2 controls on Georgia's coal-fired EGUs (see Section 2).

Table 3-2. Observed Visibility Impairment for Five-year Period through 2010 (5-yr avg* in deciviews)

	2005	2006	2007	2008	2009	2010	Change (2010-2005)
20% Worst Days							
- Cohutta**	30.43	30.52	30.43	29.63	28.01	26.18	-4.24
- Okefenokee	27.14	27.24	27.21	26.88	26.00	25.01	-2.13
- Wolf Island	27.14	27.24	27.21	26.88	26.00	25.01	-2.13
20% Best Days							
- Cohutta**	13.88	13.63	13.62	13.43	12.50	12.18	-1.70
- Okefenokee	14.95	15.03	14.90	14.90	14.46	14.19	-0.75
- Wolf Island	14.95	15.03	14.90	14.90	14.46	14.19	-0.75

* e.g., the value for 2005 is the average of the annual averages for the years 2001-2005

** No annual average for year 2006

The figures that follow display the data listed in Tables 3-1 and 3-2, as well as the uniform rate of progress towards natural background for the 20% worst days. Figure 3-1 shows the observed five-year average impairment values for the worst 20% days in the Cohutta Wilderness, as well as the associated glide slope and the predicted impairment from the regional haze SIP. The predicted impairment for 2018 is also the reasonable progress goal. The observed five-year average impairment for 2010 is below both the glide path and the predicted impairment. Figure 3-2 shows the observed five-year average impairment values for the best 20% days in Cohutta, as well as the predicted impairment from the regional haze SIP. The observed five-year average impairment for the best 20% days of 2010 is below both the baseline and the predicted impairment.

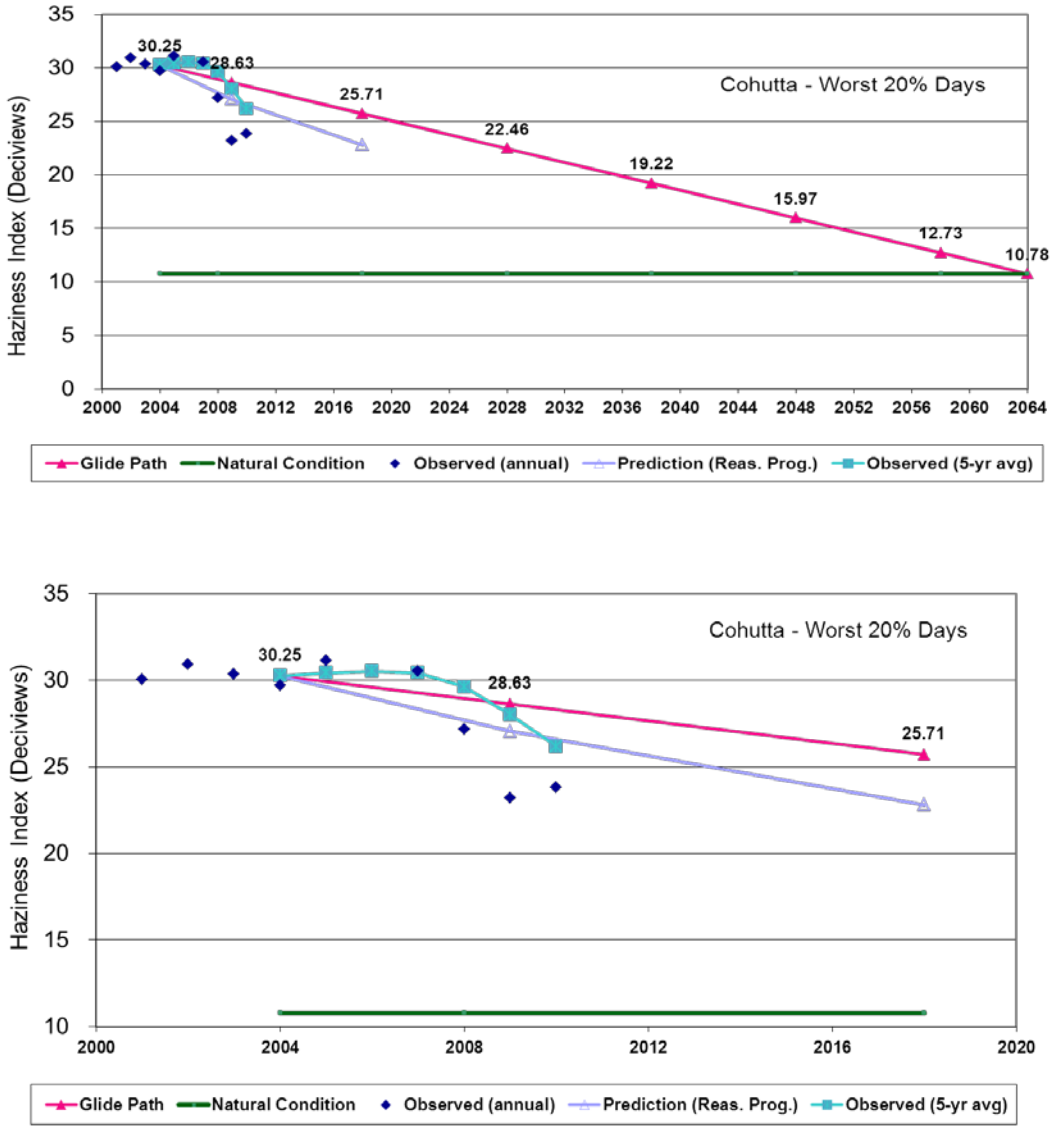


Figure 3-1. Cohutta Wilderness: Visibility impairment, worst 20% Days, glide path through 2064 (top) and through 2018 (bottom)

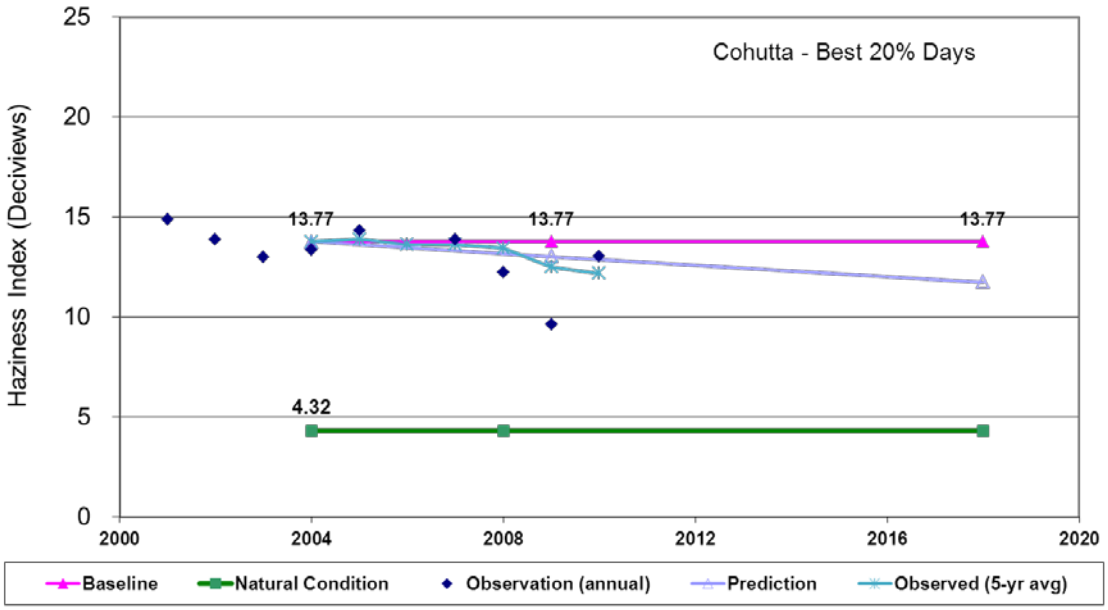
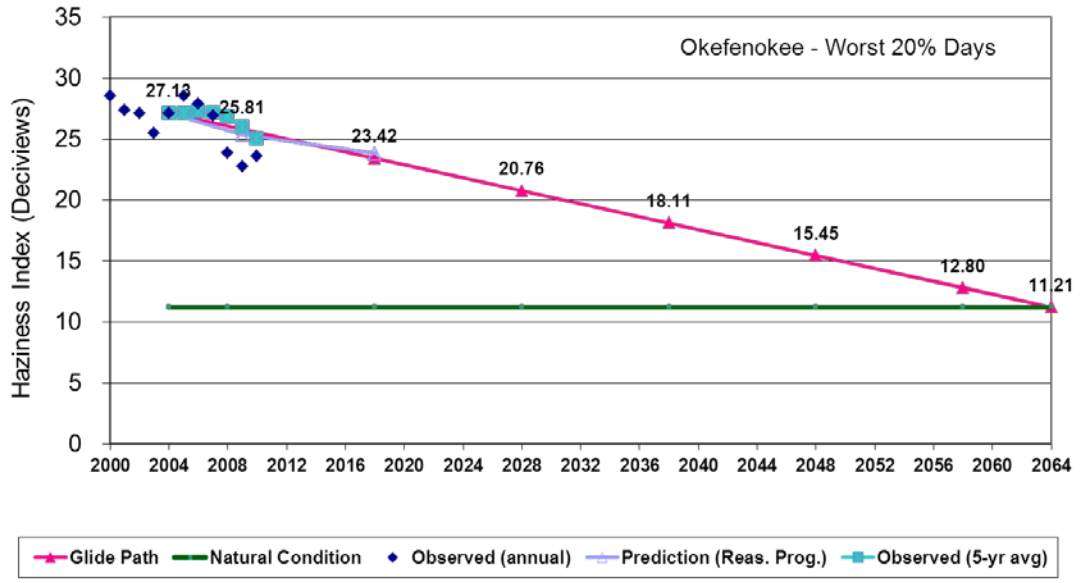


Figure 3-2. Cohutta Wilderness: Visibility impairment, best 20% Days

Figure 3-3 shows the observed five-year average impairment values for the worst 20% days in the Okefenokee National Wildlife Refuge (NWR) and the Wolf Island NWR, as well as the associated glide slope and the predicted impairment from the regional haze SIP. The predicted impairment for 2018 is also the reasonable progress goal. The observed five-year average impairment for 2010 is below the glide path and very close to the predicted impairment. Figure 3-4 shows the observed five-year average impairment values for the best 20% days in Okefenokee and Wolf Island, as well as the predicted impairment from the regional haze SIP. The observed five-year average impairment for the best 20% days of 2010 is below the baseline and very close to the predicted impairment.

Appendix D contains the observed five-year average impairment values for the worst 20% days at the other VISTAS Class I areas and neighboring Class I areas, as well as the associated glide slope and the predicted impairment from the regional haze SIP. Appendix E contains the observed five-year average impairment values for the best 20% days at the other VISTAS Class I areas and neighboring Class I areas, as well as the associated glide slope and the predicted impairment from the regional haze SIP.



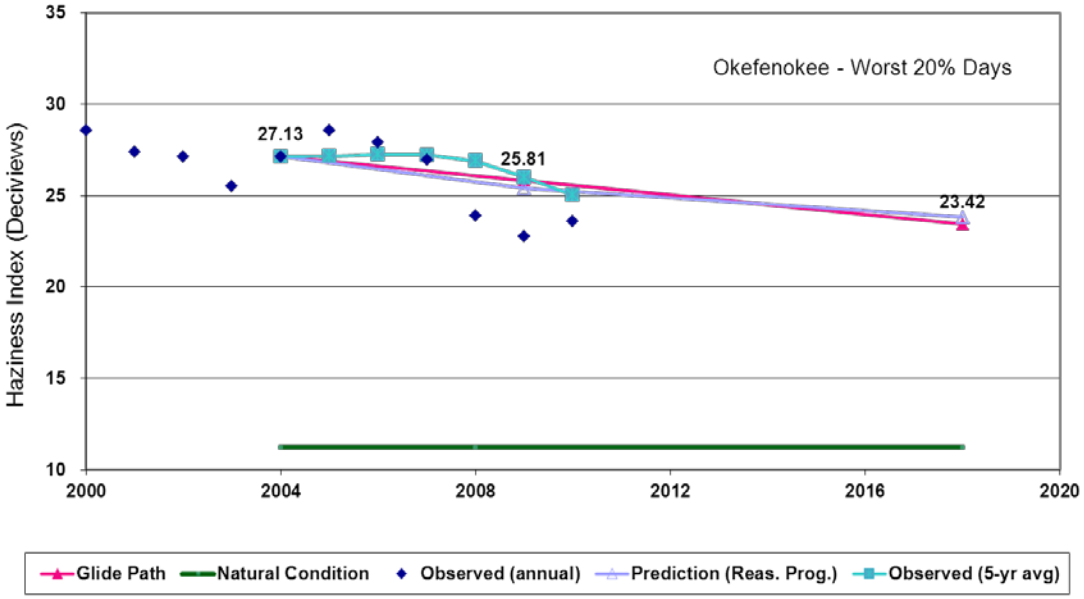


Figure 3-3. Okefenokee NWR and Wolf Island NWR: Visibility impairment, worst 20% Days, glide path through 2064 (top) and through 2018 (bottom)

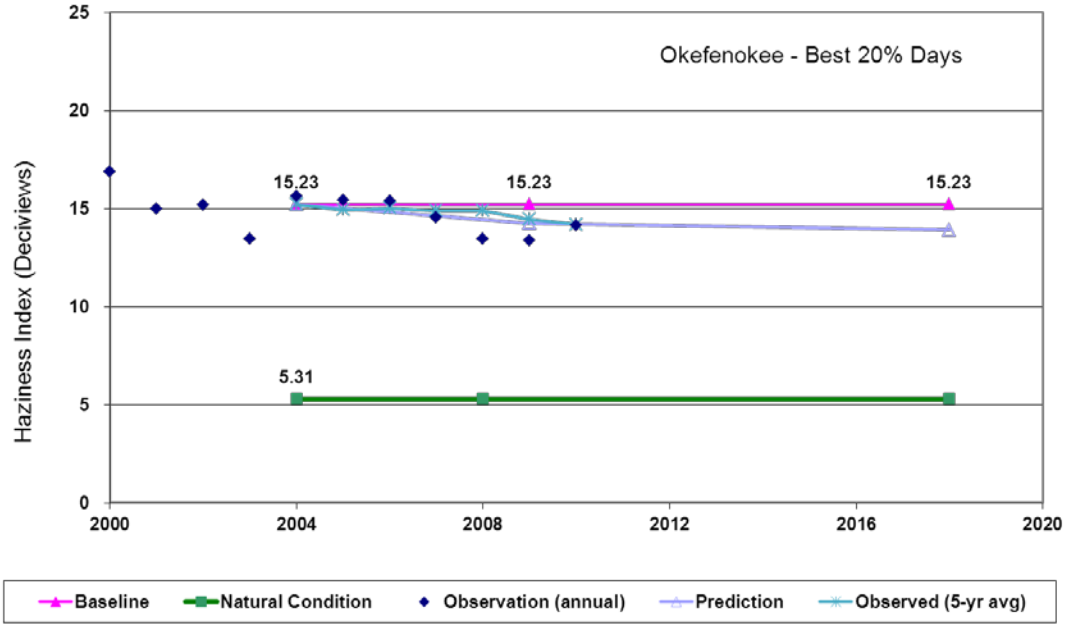


Figure 3-4. Okefenokee NWR and Wolf Island NWR: Visibility impairment, best 20% Days

4.0 Emissions Analysis

This section includes an analysis tracking the change over the past five years in emissions of pollutants contributing to visibility impairment from all sources and activities within the State, as required by 40 CFR 51.308(g)(4). Because SO_2 is the significant pollutant contributing to visibility impairment, the emissions analysis will focus mostly on SO_2 emissions. This section also includes an analysis of SO_2 emissions versus power demand which shows that the significant decrease in SO_2 emissions was primarily due to emission controls, not reduced power demand. Finally, this section includes an assessment of changes in anthropogenic emissions over the past five years, as required by 40 CFR 51.308(g)(5).

4.1 Change in $PM_{2.5}$, NO_x, and SO_2 Emissions from All Source Categories

There are six emissions inventory source categories: stationary point, area (non-point), off-road mobile, on-road mobile, fires, and biogenic sources. Stationary point sources are those sources that emit greater than a specified tonnage per year, with data provided at the facility level. Electric generating utilities and industrial sources are the major categories for stationary point sources. Stationary area sources are those sources whose individual emissions are relatively small, but due to the large number of these sources, the collective emissions from the source category could be significant (i.e., dry cleaners, service stations, agricultural sources). These types of emissions are estimated on a countywide level. Off-road (or non-road) mobile sources are equipment that can move, but do not use the roadways (i.e., lawn mowers, construction equipment, marine vessels, railroad locomotives, aircraft). The emissions from these sources, like stationary area sources, are estimated on a countywide level. On-road mobile sources are automobiles, trucks, and motorcycles that use the roadway system. The emissions from these sources are estimated by vehicle type and road type and are summed to the countywide level. Fire emissions include prescribed fire and wildfire emissions and can be summed to a countywide level or reported as a point source. Biogenic sources are the natural sources like trees, crops, grasses and natural decay of plants. The biogenic emissions are not included in this mid-course review since they were held constant as part of the original regional haze SIP modeling and are not controllable emissions.

Two inventory projects were used to support the emissions analysis presented in this section. The Visibility Improvement State and Tribal Association of the Southeast (VISTAS) inventory was performed to support preparation of regional haze SIPs by the members of the VISTAS regional planning organization. The Southeast Modeling, Analysis, and Planning (SEMAP) inventory is ongoing, but the inventory of 2007 actual emissions is complete. The objectives of the SEMAP inventory include the generation of documentation and data to support submittal of SIPs to EPA by the members of Southeastern States Air Resource Managers (SESARM). The individual inventories are described briefly in Table 4-1.

Table 4-1. VISTAS and SEMAP Inventories

Inventory	Year released	Description
VISTAS 2002A	2007	2002 actual emissions. This is the base year inventory for the regional haze SIP.
VISTAS 2002T	2007	2002 typical emissions. This is the 2002A inventory with the EGU sector inventory and the fire sector inventory modified to represent a year that is typical of the five year base period for regional haze (years 2002 through 2004). The purpose is to smooth out potential anomalies in EGU emissions (related to meteorology, economic, and outage factors) and in fire activity in a given year.
SEMAP 2007	2011	2007 actual emissions.
VISTAS 2009G4	2007	2009 projected emissions. G4 is the final version.
VISTAS 2018G4	2007	2018 projected emissions. G4 is the final version.

For the typical 2002 stationary point source emissions inventory, only those sources that reported emissions for 2002 to Georgia EPD were included in the emissions inventory. The typical 2002 stationary point source emissions inventory was developed jointly with VISTAS states for emission projection purposes. The electric generating units are adjusted so that if sources were shut down or operating above or below normal the emissions were normalized to a typical inventory year. This is necessary since the future year emissions represent a projected typical future year inventory. The 2009 and 2018 point source emissions were estimated using the Integrated Planning Model (IPM) model for the electric generating units and economic growth factors for the remaining sources.
The 2002 area source emissions were estimated by taking an activity factor and multiplying by an emission factor. The 2009 and 2018 area source emissions were projected using economic growth factors. For the non-road mobile source inventory, all but the aircraft, locomotive and commercial marine emissions were estimated using the USEPA's NONROAD2005c model for the typical 2002, 2009, and 2018 inventory years. The remaining non-road mobile sources were estimated the traditional way by taking an activity level and multiplying it by an emission factor and these sources were projected to 2009 and 2018 using economic growth factors. The on-road mobile source emissions were estimated using the USEPA's MOBILE6.2 mobile model for the typical 2002 and projected 2009 and 2018 inventory years. The 2002 wildfire and prescribed fire emissions were normalized to a typical year and held constant in 2009 and 2018.

The five-year look back compares 2007 SO_2, NO_x, and $PM_{2.5}$ emissions to 2002 actual emissions. The 2007 SEMAP inventory used actual point (see Appendix F), area (see Appendix G), nonroad (see Appendix G), and on-road (see Appendix H) emissions and typical 2007 fire (see Appendix I) emissions. Although the 2008 NEI was available at the time this report was written, Georgia EPD felt that the SEMAP 2007 inventory was a more accurate and more detailed inventory. Additional QA time and effort was performed on the 2007 inventory to create a SIP quality inventory.

Therefore, this analysis uses 2007 instead of 2008 for the 5-year look back period. In addition, 2007-2010 "actual" SO_2 emissions are compared to VISTAS 2009 projections.

The SEMAP 2007 $PM_{2.5}$ emissions are higher than the VISTAS 2002 emissions, but are lower than the VISTAS 2009G4 emissions (Table 4-2, Figure 4-1). There were large decreases in area sources and large increases in on-road mobile sources. The decrease in area source $PM_{2.5}$ is primarily due to a change in the methodology used to calculate this source category (removed coal and wood combustion boilers from the area source inventory to avoid double counting with the point source category). The increase in on-road mobile $PM_{2.5}$ is due to the switch in model used (MOBILE6.2 replaced with MOVES2010a).

Table 4-2. PM2.5 emissions (tons) for VISTAS (2002A, 2002T, 2009G4, 2018G4) and SEMAP (2007) inventories

Sector	VISTAS 2002A	VISTAS 2002T	SEMAP 2007	VISTAS 2009G4	VISTAS 2018G4
Point	22,401	22,532	25,058	29,890	36,297
Area	103,726	103,726	83,594	111,924	123,610
On-road	5,168	5,168	13,681	3,840	2,380
Non-road	8,226	8,226	6,608	7,175	5,730
Fires	57,293	55,712	68,766	57,087	57,087
Total	**196,814**	**195,364**	**197,707**	**209,916**	**225,104**

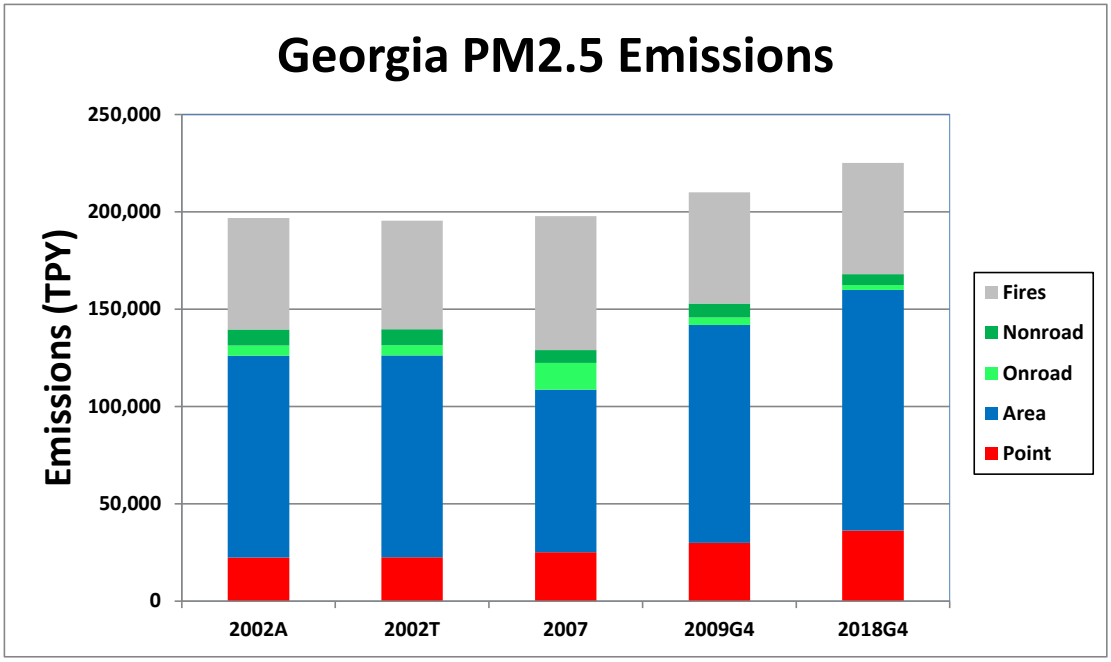


Figure 4-1. $PM_{2.5}$ emissions for VISTAS (2002A, 2002T, 2009G4, 2018G4) and SEMAP (2007) inventories.

The SEMAP 2007 NO_x emissions are higher than the VISTAS 2002 and VISTAS 2009G4 emissions (Table 4-3, Figure 4-2). There were large decreases in point and area sources and large increases in on-road mobile sources. The decreases in point source NO_x were due to emissions controls that were installed. The decrease in area source NO_x is primarily due to a change in the methodology used to calculate this source category (removed coal and wood combustion boilers from the area source inventory to avoid double counting with the point source category). The increase in on-road mobile NO_x is due to the switch in model used (MOBILE6.2 replaced with MOVES2010a). If a consistent model was used for 2002, 2007, and 2009, the SEMAP 2007 NO_x emissions would have been lower than the VISTAS 2002 and VISTAS 2009G4 emissions.

Table 4-3. NO_x emissions (tons) for VISTAS (2002A, 2002T, 2009G4, 2018G4) and SEMAP (2007) inventories

Sector	VISTAS 2002A	VISTAS 2002T	SEMAP 2007	VISTAS 2009G4	VISTAS 2018G4
Point	196,767	197,377	154,041	148,850	125,680
Area	36,105	36,105	12,351	37,689	41,282
On-road	307,732	307,732	396,837	209,349	102,179
Non-road	97,961	97,961	91,081	85,733	64,579
Fires	14,203	13,882	19,429	14,236	14,236
Total	**652,768**	**653,057**	**673,739**	**495,857**	**347,956**

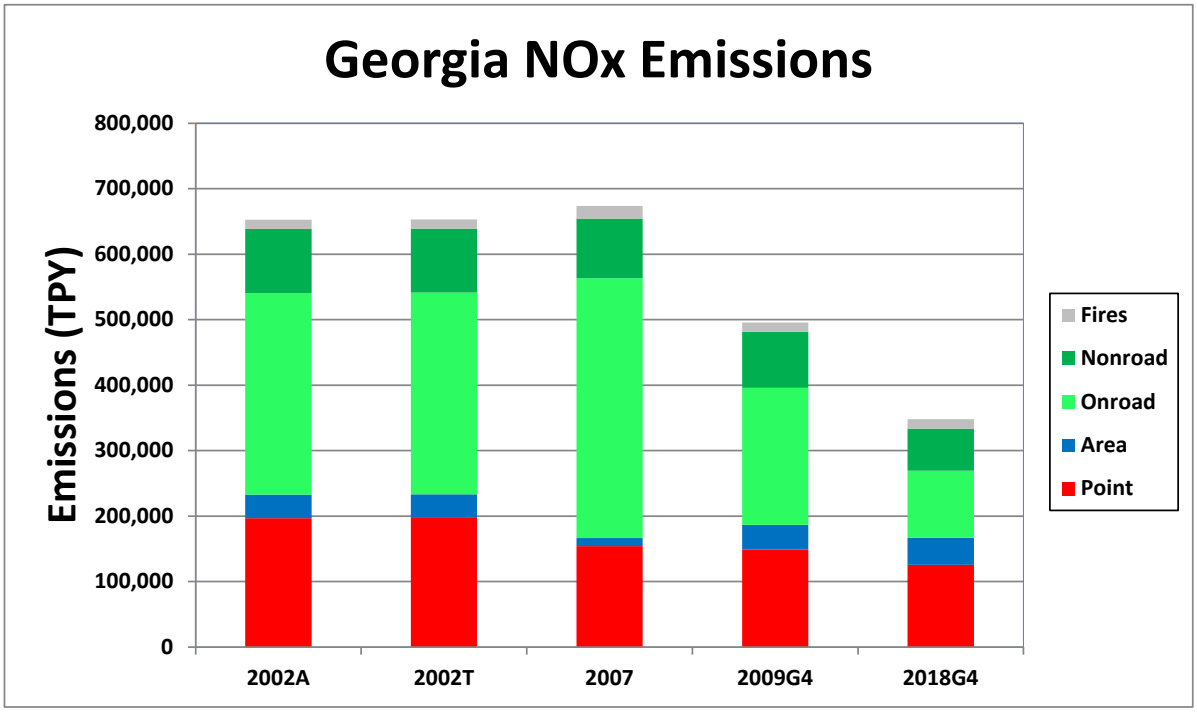


Figure 4-2. NO_x emissions for VISTAS (2002A, 2002T, 2009G4, 2018G4) and SEMAP (2007) inventories.

The SEMAP 2007 SO_2 emissions are higher than the VISTAS 2002 and VISTAS 2009G4 emissions (Table 4-4, Figure 4-3). There were large increases in point sources and large decreases in area sources. The increases in point source SO_2 were due to increased generation from EGUs (2007 heat input was approximately 25% higher than 2002). The decrease in area source SO_2 is primarily due to a change in the methodology used to calculate this source category (removed coal and wood combustion boilers from the area source inventory to avoid double counting with the point source category).

Table 4-4. SO_2 emissions (tons) for VISTAS (2002A, 2002T, 2009G4, 2018G4) and SEMAP (2007) inventories

Sector	VISTAS 2002A	VISTAS 2002T	SEMAP 2007	VISTAS 2009G4	VISTAS 2018G4
Point	568,731	571,411	683,358	462,666	127,864
Area	57,555	57,555	4,858	57,692	59,724
On-road	12,184	12,184	6,407	1,585	1,457
Non-road	9,005	9,005	5,983	2,725	1,709
Fires	3,372	2,815	4,492	2,912	2,912
Total	**650,847**	**652,970**	**705,098**	**527,580**	**193,666**

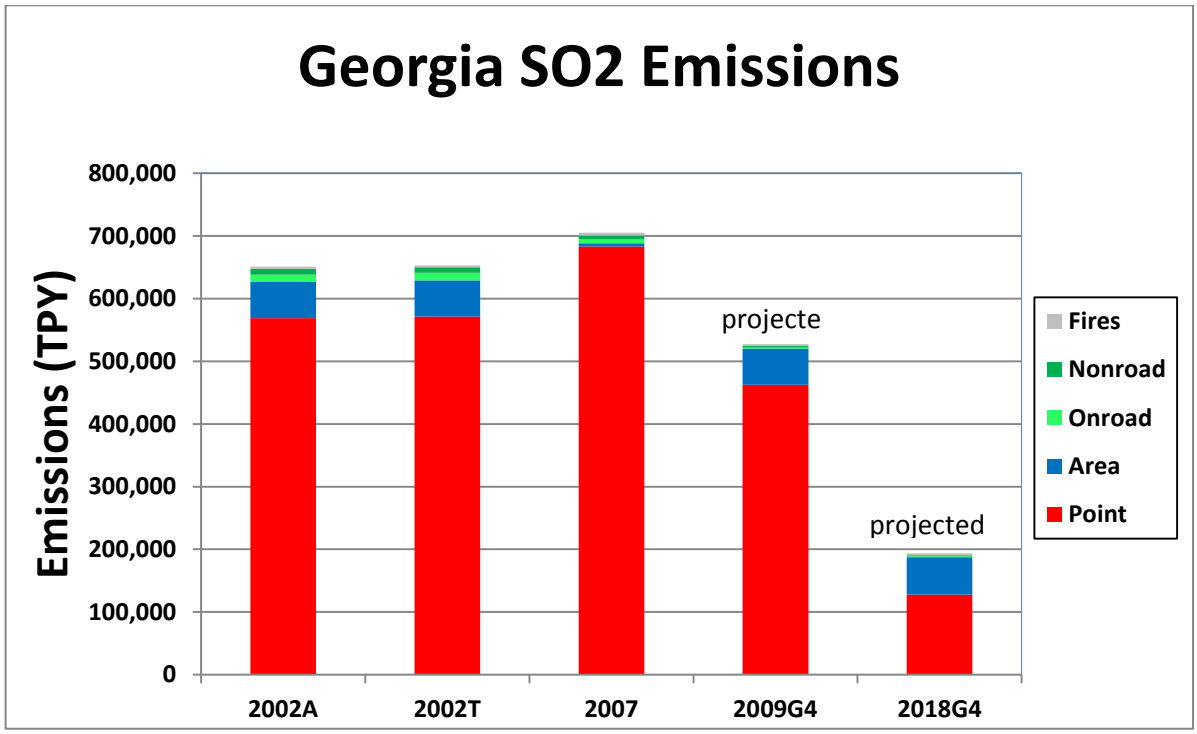


Figure 4-3. SO_2 emissions for VISTAS (2002A, 2002T, 2009G4, 2018G4) and SEMAP (2007) inventories.

Although point source SO_2 increased in 2007 and was well over the 2009 projected SO_2 emissions, substantial SO_2 reductions were achieved in 2008, 2009, 2010, and 2011 due to installation of scrubbers at many coal-fired EGUs in Georgia. Table 4-5 shows the change in SO_2 emissions from EPA's Clean Air Markets Division (CAMD) database.

Table 4-5. EGU SO_2 emissions for CAMD (2007 - 2011)

SO_2 Emissions	**2007**	**2008**	**2009**	**2010**	**2011**
CAMD (tons)	635,484	514,539	262,337	218,904	186,859
Change from 2007 (tons)	**0**	**120,945**	**373,147**	**416,580**	**448,625**

The 2007 actual point SO_2 inventory was adjusted to reflect the changes in CAMD SO_2 emissions for 2008, 2009, 2010, and 2011 (Table 4-6, Figure 4-4). The other source sectors (area, on-road, non-road, and fires) were left at 2007 SEMAP values.

Table 4-6. SO_2 emissions (tons) for SEMAP (2007), SEMAP/CAMD adjusted (2008 - 2011), and VISTAS (2009G4) inventories

Sector	**Actual 2007**	**"Actual" 2008***	**"Actual" 2009***	**VISTAS 2009G4**	**"Actual" 2010***	**"Actual" 2011***
Point	683,358	562,413	310,211	462,666	266,778	234,733
Area	4,858	4,858	4,858	57,692	4,858	4,858
On-road	6,407	6,407	6,407	1,585	6,407	6,407
Non-road	5,983	5,983	5,983	2,725	5,983	5,983
Fires	4,492	4,492	4,492	2,912	4,492	4,492
Total	**705,098**	**584,153**	**331,951**	**527,580**	**288,518**	**256,473**

*Data from 2007 SEMAP inventory with EGU emissions replaced with year-specific CAMD data.

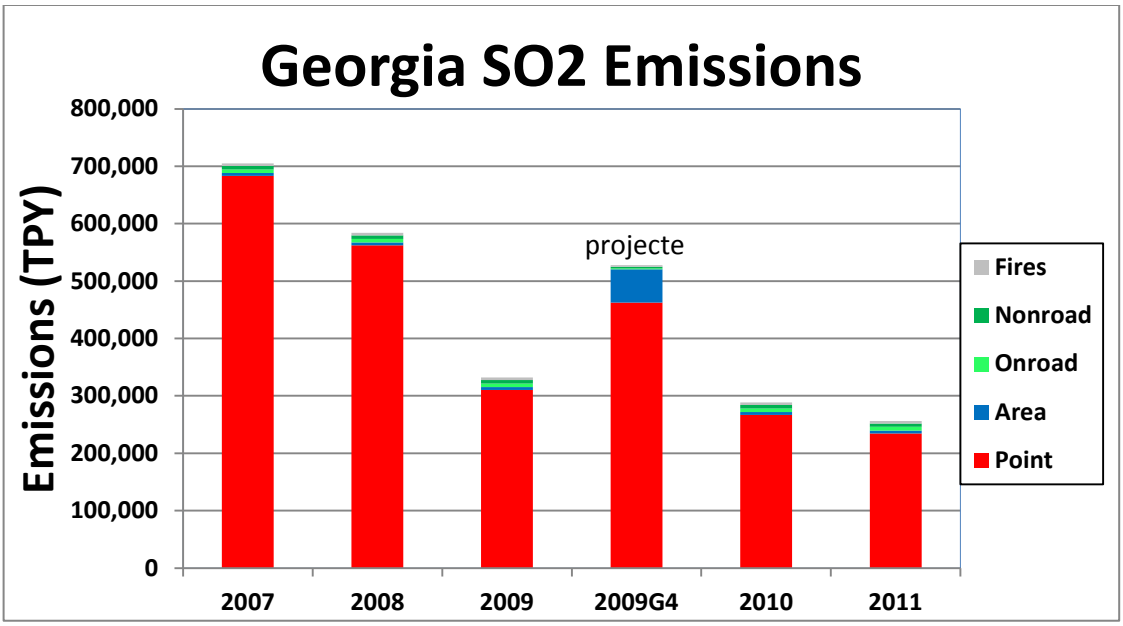


Figure 4-4. SO_2 emissions for SEMAP (2007), SEMAP/CAMD adjusted (2008 - 2011), and VISTAS (2009G4) inventories.

The 2009, 2010, and 2011 "actual" total SO_2 emissions are well below the 2002 VISTAS actual SO_2 emissions and 2009 VISTAS projected SO_2 emissions (see Table 4-7). The 2009 actual SO_2 emissions are 37.1 % less than the 2009 projected SO_2 emissions (2009G4), indicating that EGU SO_2 emissions reductions have occurred ahead of the schedule required by Georgia's Multipollutant rule (see Section 2).

Table 4-7. Comparison of SO_2 emissions inventories to 2002 baseline

Inventory Year	SO_2 emissions	Compared to 2002 (tons)	Compared to 2002 (%)
2002A (VISTAS)	650,847	-	-
2007 (SEMAP)	705,098	54,251	8.3
2009*	331,951	-318,896	-49.0
2009G4 (VISTAS projection)	527,580	-123,267	-18.9
2010*	288,518	-362,329	-55.7
2011*	256,473	-394,374	-60.6

* 2007 SEMAP/CAMD adjusted

4.2 EGU Point Sources: SO_2 Emissions Reductions and Power Demand

The large reductions in SO_2 emissions from electric generating units during 2008-2011 resulted from many factors, including control installations, units switching to cleaner fuels, load shifting from dirtier units to cleaner units, and an overall decrease in demand for generation. CAMD data for Acid Rain Program units from 2002 through 2011 indicate that reductions in SO_2 emissions appear to be maintained, and further reductions achieved, even though heat input to these units increased in 2010. This generality is true for Georgia EGUs and across VISTAS.

Figure 4-5 depicts the trends for Acid Rain Program units that report annual emissions to CAMD and are located in Georgia. Between 2002 and 2011, heat input to these units decreased from approximately 843,964,076 MMBtu to 835,494,381 MMBtu, a decrease of 1.0%. SO_2 emissions from these units decreased from 512,654 tons annually in 2002 to 186,859 tons annually in 2011, a decrease of 63.6%, and the average SO_2 emission rate from these units decreased from 1.215 lbs SO_2/MMBtu in 2002 to 0.447 lbs SO_2/MMBtu in 2011, a decrease of 63.2%. The reductions in emissions are not attributable to reduced demand for power. Instead, the significant emission reductions are attributable to the overall emissions rate decrease that is due to the installation of controls and the use of cleaner burning fuels. NO_x emissions decreased from 146,456 tons in 2002 to 54,823 tons in 2011, a drop of 62.6 percent.

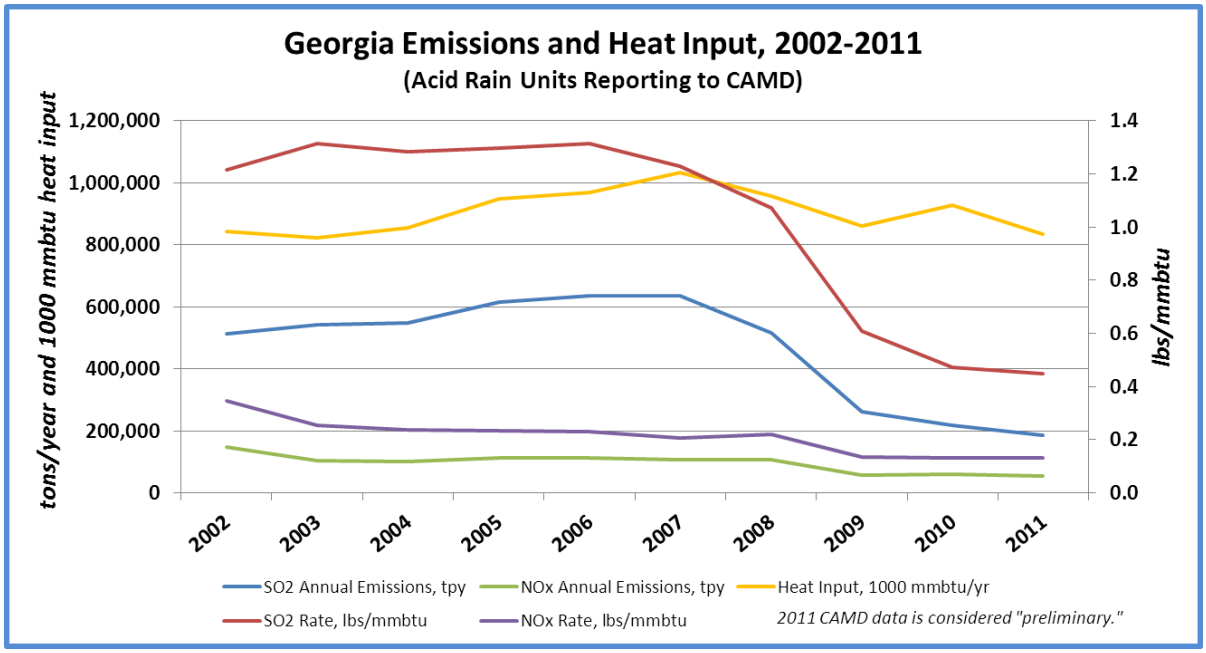


Figure 4-5. Georgia Acid Rain Program Unit Emissions and Heat Input Data *(source: USEPA CAMD Database).*

A comparison of 2009 and 2011 data for Georgia shows similar results. Heat input decreased between 2009 and 2011 from 860,174,075 MMBtu in 2009 to 835,494,381

MMBtu in 2011. Emissions fell from 262,258 tons of SO_2 in 2009 to 186,859 tons of SO_2 in 2011, and the emissions rate dropped from 0.610 lbs SO_2/MMBtu to 0.447 lbs SO_2/MMBtu. The overall Georgia emission rate is expected to continue to drop in 2012-2016 due to the startup of additional scrubbing capacity in Georgia and to fuel switches.

Figure 4-6 shows the trends for the Acid Rain Program units across all VISTAS states. Trends for the 10 individual VISTAS states can be found in Appendix J. Between 2002 and 2011, heat input to these units decreased from 7,645,295,464 MMBtu to 7,336,055,333 MMBtu, a decrease of 4.0%. SO_2 emissions from these units decreased from 3,713,262 tons annually in 2002 to 1,166,572 tons annually in 2011, a decrease of 69.9%, and the average SO_2 emission rate from these units decreased from 0.971 lbs SO_2/MMBtu in 2002 to 0.318 lbs SO_2/MMBtu in 2011, a decrease of 67.3%. As additional controls are installed to meet the stringent requirements of MATS, this emission rate may decrease even further. NO_x emissions decreased from 1,498,143 tons in 2002 to 464,129 tons in 2011, a drop of 69 percent.

Between 2009 and 2011, the total VISTAS states' heat input for Acid Rain Program units increased from 6,966,765,915 MMBtu to 7,336,055,333 MMBtu. Emissions dropped in the VISTAS states for these units from 1,619,348 tons of SO_2 in 2009 to 1,166,572 tons of SO_2 in 2011, and the emission rates of SO_2 fell from 0.465 lbs/MMBtu to 0.318 lbs/MMBtu.

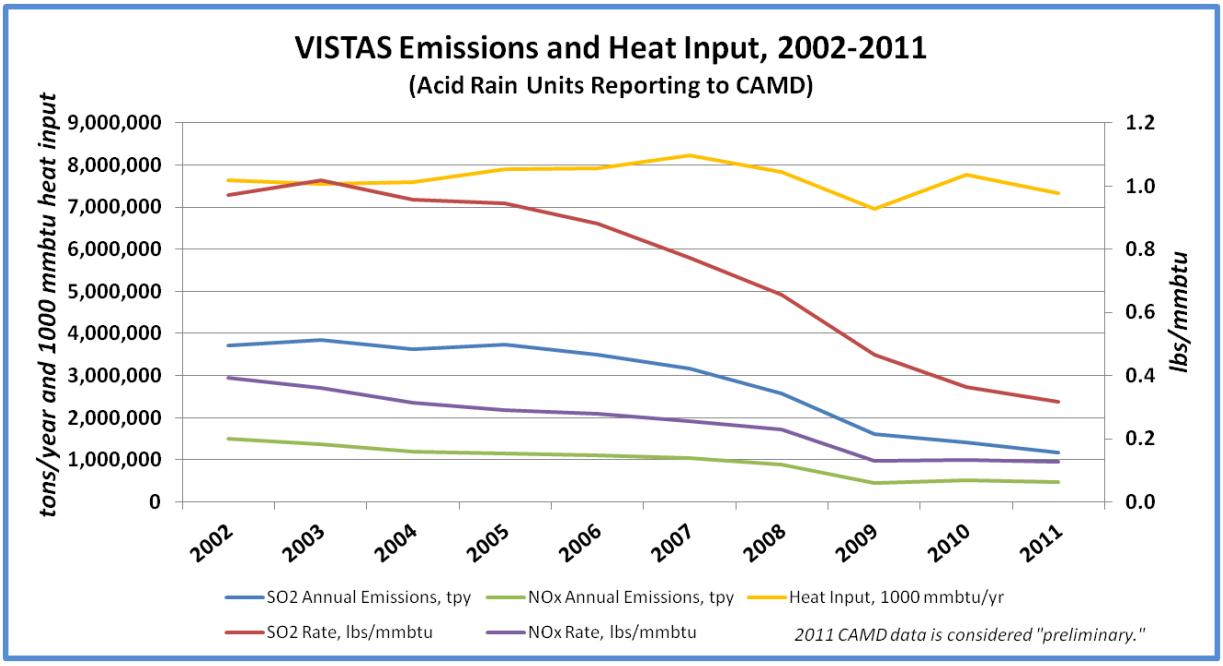


Figure 4-6. VISTAS Acid Rain Program Unit Emissions and Heat Input Data *(source: USEPA CAMD Database).*

Since sulfates have been shown to be the predominant species of concern to visibility impairment in the Cohutta Wilderness Area, Okefenokee National Wildlife Refuge, and Wolf Island National Wildlife Refuge during the first round of Regional Haze planning, visibility improvements from reduced sulfate contribution should continue into the future even though

demand for power and heat input to these units may increase. Table 4-8 summarizes these numbers for VISTAS states and for Georgia.

Table 4-8. Comparison of Acid Rain Program Data for 2002, 2009, 2010, and 2011

Year	VISTAS Acid Rain Unit Data			Georgia Acid Rain Unit Data		
	Heat Input MMBtu/hr	SO_2 Emissions tons/year	SO_2 Rate lbs/MMBtu	Heat Input MMBtu/hr	SO_2 Emissions tons/year	SO_2 Rate lbs/MMBtu
2002	7,645,295,464	3,713,262	0.971	843,964,076	512,654	1.215
2009	6,966,765,915	1,619,348	0.465	860,174,075	262,258	0.610
2010	7,760,905,869	1,415,331	0.365	928,020,484	218,836	0.472
2011	7,336,055,333	1,166,572	0.318	835,494,381	186,859	0.447

Data for Acid Rain Program units, USEPA CAMD Database

4.3 Assessments of Changes in Anthropogenic Emissions

There does not appear to be any significant change in anthropogenic emissions within Georgia that would have limited or impeded progress in reducing pollutant emissions or improving visibility. This is evident by comparing the point source SO_2 emissions in the base year (2002) to the most recent SO_2 emissions (2007-2011). There are significant decreases in point SO_2 emissions, in spite of the fact that power generation has remained fairly constant during the same period.

5.0 Assessment of Current SIP Elements and Strategies

40 CFR 51.308(g)(6) requires an assessment of whether the current SIP elements and strategies are sufficient to enable the State, and other Class I areas affected by emissions from the State, to meet all established reasonable progress goals. For the reasons described below, Georgia EPD believes that Georgia's current SIP elements and strategies are sufficient to meet reasonable progress goals for the year 2018.

In the case of Georgia's Class I areas, this progress report has documented the following:

- Speciated data collected for the period 2006 – 2010 shows that sulfates continue to be the most significant contributor to visibility impairment, so SO_2 reduction continues to be the appropriate control strategy (Section 1.4)
- SO_2 controls documented in the SIP have been implemented on time or ahead of schedule through 2009, and enforceable requirements for all planned controls through 2018 are still in place (Section 2.1). Amendments to Georgia rule 391-3-1.02 (sss) have changed the control schedules for three units at Plant Branch, but this should result in a net decrease in Branch's total SO_2 emissions for the period 2014 through 2015 compared to the original SIP projections.
- Observed visibility impairment values for the 20% worst days through 2010 are better (lower) than the 2010 interpolated values for the 2018 reasonable progress goals and better than the 2010 glide slope values; all observed visibility impairment values for the 20% best days are below the baseline (Section 3.0)
- A 56% reduction in the overall SO_2 emissions inventory from 2002 through 2010 verifies that Georgia's SO_2 reduction program is in fact achieving the reductions that were projected in the regional haze SIP (Section 4.1)

Based on the points listed above, Georgia EPD believes that the State's current implementation plan elements and strategies are sufficient to enable Georgia to meet the 2018 reasonable progress goals for its Class I areas.

In Georgia's regional haze SIP, it was determined that emission sources located in Georgia may have significant sulfate visibility impacts on the following Class I areas in neighboring states:

- Cape Romain NWR, South Carolina
- Shining Rock Wilderness Area, North Carolina
- Swanquarter NWR, North Carolina
- Joyce Kilmer - Slick Rock Wilderness Area, North Carolina and Tennessee
- Great Smoky Mountains National Park, Tennessee, North Carolina
- Sipsey Wilderness Area, Alabama
- St. Marks NWR, Florida

The specific emissions sources having significant impacts and the corresponding impacted Class I areas are shown in Tables 2-2 and 2-3.

The locations of these areas, as well as the other Class I areas in the VISTAS region, are shown in Figure 5-1. Visibility data through 2010 show that the 2010 five-year average visibility impairment on the worst 20% days in the above Class I areas is at or below the glide slope for each respective

area (see Appendix D). Furthermore, visibility impairment in each of these areas decreased over the period 2008 through 2010.

Figure 5-1. Class I Areas in the VISTAS Region

The status of SO_2 controls on Georgia sources that impact the seven out-of-state Class I areas was presented in Sections 2.1.2 and 2.1.3 of this progress report. All of the controls have been or will be implemented on time. Also, a plan to build a coal-fired power plant (Longleaf Energy Station) in south Georgia has been withdrawn. This plant was projected in the original SIP to have significant visibility impact on Saint Marks National Wildlife Refuge (Florida).

Based on the observed visibility trends, the status of controls on Georgia sources, and the withdrawal of Longleaf Energy, Georgia EPD believes that the State's current implementation plan elements and strategies are sufficient to enable these neighboring Class I areas to achieve their 2018 reasonable progress goals. This is based on the assumption that the other VISTAS states will also meet their commitments for emissions reductions on time.

6.0 Review of Visibility Monitoring Strategy

40 CFR 51.308(g)(7) requires a review of the State's visibility monitoring strategy and any changes that may be needed. A visibility monitoring strategy is crucial for the assessment of reasonable progress towards natural background visibility and the ongoing identification of the pollutant species having the greatest impact on visibility in the Class I areas. Georgia's visibility monitoring strategy was described in detail in the regional haze SIP and the strategy has not changed.

The primary monitoring network for regional haze is the Interagency Monitoring of Protected Visual Environments (IMPROVE) network. The IMPROVE network is funded by EPA and the FLMs and each monitoring station is operated by the FLM responsible for the given Class I area. Georgia's understanding is that EPA and the FLMs will continue to support the IMPROVE network.

Given that IMPROVE monitoring data from 2000-2004 serve as the baseline for the regional haze program, the future regional haze monitoring strategy should be based on IMPROVE data (or data directly comparable to IMPROVE data). The IMPROVE measurements provide the only long-term record available for tracking visibility improvement or degradation. Therefore, Georgia will continue to rely on the IMPROVE network for complying with the regional haze monitoring requirement in the Regional Haze Rule. There are currently two IMPROVE monitoring sites in the State: one in the Cohutta Wilderness Area (COHU1) and one in the Okefenokee National Wildlife Refuge (OKEF1). Measurements from the OKEF1 monitor are used to represent visibility in both the Okefenokee and Wolf Island Class I areas.

Table 6-1. IMPROVE monitoring sites for Class I areas in Georgia

Class I Area	IMPROVE Site Designation
Cohutta Wilderness Area	COHU1
Okefenokee National Wildlife Refuge	OKEF1
Wolf Island National Wildlife Refuge	OKEF1

The Visibility Information Exchange Web System (VIEWS) web site provides ready access to the IMPROVE data and data analysis tools. The site is maintained by the Cooperative Institute for Research in the Atmosphere (CIRA) and is currently sponsored by the Western Regional Air Partnership. Previous sponsors include VISTAS, other regional planning organizations, and EPA. Georgia will continue to rely on VIEWS to facilitate analysis of the IMPROVE data.

Through the year 2010, the data gathered by Georgia's two IMPROVE monitoring sites and managed on the VIEWS database have provided satisfactory support for Georgia's compliance with the Regional Haze rule. Georgia EPD is not recommending any changes to the visibility monitoring strategy at this time.

7.0 Consultation with Federal Land Managers

Georgia EPD provided Federal Land Managers (FLMs) the opportunity to comment on the draft progress report, as required in subparagraph 40 CFR §51.308(i) of the regional haze rule. A copy of the progress report was provided to the following FLMs:

- U.S. Fish and Wildlife Service
- U. S. Forest Service
- National Park Service

Correspondence with and comments from the FLMs and Georgia EPD's responses to the comments are included as Appendix K.

8.0 Conclusion

This progress report documents that all control measures outlined in Georgia's original regional haze SIP are on track to meet their implementation schedules and that reduction of SO_2 emissions continues to be the appropriate strategy for improvement of visibility in Georgia's Class I areas. The change in actual emissions of SO_2 from all sources from 2002 through 2010 is a 56% reduction (362,300 tons) and visibility impairment observations through 2010 are better (lower) than the 2010 interpolated values for the reasonable progress goals and the glide slope. Therefore Georgia EPD believes that the State's current implementation plan elements and strategies are sufficient to enable the State, and other states with Class I areas affected by emissions from Georgia sources, to meet all established reasonable progress goals.

A declaration that further revision of Georgia's regional haze SIP is not needed at this time will be submitted to EPA with this progress report. This negative declaration will meet the requirement of 40 CFR 51.308 (h).