TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

# AGENDA ITEM REQUEST

for Proposed State Implementation Plan

**AGENDA REQUESTED:** June 18, 2013

**DATE OF REQUEST:** May 30, 2013

**INDIVIDUAL TO CONTACT REGARDING CHANGES TO THIS REQUEST, IF NEEDED:** Joyce Nelson, (512) 239-5017

**CAPTION: Docket No. 2013-0595-SIP.** Consideration for publication of, and hearing on, proposed 2014 Five-Year Regional Haze State Implementation Plan Revision.

The proposed SIP revision would satisfy the federal Regional Haze Rule, which requires states to submit progress reports for each mandatory Class I federal area in the state in the form of SIP revisions every five years [40 CFR §51.308(g)]. According to the rule, the deadline for Texas to submit a five-year regional haze SIP revision is March 19, 2014, five years after submittal of the initial regional haze SIP revision. The report must evaluate improvement towards the reasonable progress goal for each mandatory Class I federal area located within the state and in each Class I area outside the state that may be affected by emissions from within the state. The state is required to compare data from the baseline years (2000 through 2004) to the most current available five years (2005 through 2009) provided by the Interagency Monitoring of Protected Visual Environments network. (Margaret Earnest, John Minter) (Rule Project No. 2013-013-SIP-NR)

Steve Hagle, P.E.
**Deputy Director**

David Brymer
**Division Director**

Joyce Nelson
**Agenda Coordinator**

**Copy to CCC Secretary? NO X YES**

# Texas Commission on Environmental Quality
## Interoffice Memorandum

**To:** Commissioners **Date:** May 30, 2013

**Thru:** Bridget C. Bohac, Chief Clerk
Zak Covar, Executive Director

**From:** Steve Hagle, P.E., Deputy Director
Office of Air

**Docket No.:** 2013-0595-SIP

**Subject:** Commission Approval for Proposed 2014 Five-Year Regional Haze State Implementation Plan (SIP) Revision

Proposed 2014 Five-Year Regional Haze SIP Revision
Non-Rule Project No. 2013-013-SIP-NR

**Background and reason(s) for the SIP revision:**
Federal Clean Air Act (FCAA), §169A and B requires the United States Environmental Protection Agency (EPA) to adopt regulations and states to submit state implementation plan (SIP) revisions to reduce visibility impairment resulting "from man-made air pollution," known as regional haze, in 156 mandatory Class I federal areas (Class I areas). The FCAA requires each regional haze SIP revision to include control measures, including Best Available Retrofit Technology (BART), to make reasonable progress toward the national goal of natural visibility conditions at all Class I areas. The two Class I areas in Texas are Big Bend and Guadalupe Mountains National Parks. Each state bordering Texas has one or more Class I areas designated for visibility protection (see attached map). Texas' regional haze SIP revision must examine the need to include measures to reduce visibility impacts in Texas' Class I areas and other states' Class I areas that Texas may impact.

The EPA adopted the regional haze rule (the Rule) in 40 Code of Federal Regulations (CFR) Part 51, Subpart P, on July 1, 1999 and adopted amendments to Subpart P and a new Appendix Y (BART guidelines) to Part 51 on July 6, 2005. The Rule encourages states to work together in regional partnerships to reduce haze. There are five regional planning organizations in the United States. Texas is a member of the Central States Air Resource Agencies (CenSARA), which includes eight states: Texas, Louisiana, Oklahoma, Arkansas, Kansas, Missouri, Nebraska, and Iowa. In preparing its 2009 regional haze SIP submittal, Texas coordinated with the states in the Central States Regional Air Planning Association (CENRAP). CENRAP subsequently has ceased to function, and Texas is communicating through CenSARA with the other states that previously comprised CENRAP.

The Rule requires states to submit progress reports for each Class I area in the state in the form of SIP revisions every five years [40 CFR §51.308(g)]. The state is required to compare data from the baseline years (2000 through 2004) to the most current available five years (2005 through 2009) provided by the Interagency Monitoring of Protected Visual Environments network. According to the Rule, the deadline for Texas to submit a five-year regional haze SIP revision is March 19, 2014, five years after submittal of the initial regional haze SIP revision. Section 51.308(g) provides that the report must evaluate

"progress towards the reasonable progress goal for each Class I area located within the state and in each Class I area outside the state which may be affected by emissions from within the state." The Rule requires the revision to contain seven minimum elements (see *Scope of the SIP revision item B.*). On April 12, 2013, the EPA released a guidance document to assist states in addressing the requirements for a five-year regional haze SIP revision [*General Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and EPA Regional Offices in Development and Review of the Progress Reports)*].

The Texas 2009 regional haze SIP revision relied on Clean Air Interstate Rule (CAIR) nitrogen oxides ($NO_X$) and sulfur dioxide ($SO_2$) emission reductions, which the EPA determined were "better than BART" for emissions reductions from electric generating units (EGU). The 2009 regional haze SIP revision projects that the two Class I areas in Texas will not meet the 2064 federal goal for visibility due to emissions from other areas in the United States and international sources. However, the regional haze SIP revision projects that Texas will meet its own established reasonable progress goals for 2018 for all Class I areas it affects. The EPA has not fully acted on Texas' regional haze SIP revision submission. According to an amended consent decree, the EPA must make a final determination on the Texas 2009 regional haze SIP revision by December 13, 2014.

On December 30, 2011, the EPA issued notice to Texas (and other states) that because the states' regional haze SIP revisions relied on CAIR to satisfy certain emission reduction requirements, the EPA was proposing a limited disapproval of the states' SIP revisions and a federal implementation plan (FIP) to replace reliance on CAIR with reliance on the Cross-State Air Pollution Rule (CSAPR). On June 7, 2012, the EPA published final, limited disapproval for the part of the Texas 2009 regional haze SIP revision that relied on CAIR but did not simultaneously finalize a FIP that would have replaced CAIR with CSAPR for Texas. The FIP was not finalized to allow the EPA more time to assess the full Texas 2009 regional haze SIP revision. On August 21, 2012, the United States Court of Appeals for the District of Columbia vacated CSAPR and determined that CAIR will remain in place until the EPA develops a valid replacement rule. The EPA requested a rehearing *en banc*, which the Court denied on January 24, 2013. On March 29, 2013, the EPA filed a petition for certiorari with the Supreme Court seeking review of the D.C. Circuit's opinion. The EPA issued a memo on November 19, 2012 to assist states and the EPA regional offices in determining how the court-ordered vacatur of CSAPR will impact the EPA's proposed limited disapproval and FIP for regional haze. With respect to the disapproval for Texas' regional haze SIP revision, the memo states the EPA plans to "await the decision on [the] petition for rehearing," rather than make a decision to "revisit" its decision. The EPA's memo also suggested states and the agency move forward as if a federal trading program will be functioning after court suits are settled.

**Scope of the SIP revision:**
Section 169A of the FCAA established a national goal of remedying existing visibility impairment from man-made emissions in Class I areas. This section and the Rule require

states to make reasonable progress toward the national goal of natural visibility conditions at all Class I areas.

Section 51.308(g) of the Rule requires each state to submit progress reports for each Class I area in the state in the form of SIP revisions every five years and also provides that the report must evaluate "progress towards the reasonable progress goal for each mandatory Class I area located within the state and in each Class I area outside the state which may be affected by emissions from within the state."

In 2012 phone consultations with CenSARA, the EPA and National Park Service stated that no new modeling is required for a five-year regional haze SIP revision. Both federal agencies agreed that including current Interagency Monitoring of Protected Visual Environments (IMPROVE) data and updated emissions inventories in this five-year regional haze SIP revision will suffice.

Section 51.308(h) requires the progress report to include a negative declaration that further revision of the existing SIP is not needed at this time, if it is determined that the existing plan requires no further substantive revision to achieve established goals for visibility improvement and emissions reductions. If progress is inadequate, then the regional haze SIP revision must be revised to address deficiencies.

**A.) Summary of what the SIP revision will do:**
This SIP revision tracks progress toward reasonable progress goals.

**B.) Scope required by federal regulations or state statutes:**
The progress report must contain at a minimum: 1) the status of control measures included in the plan; 2) a summary of emissions reductions achieved from the plan; 3) an assessment of visibility conditions and changes for each Class I area in Texas and that Texas may impact; 4) an analysis of emissions reductions by pollutant, identified by source or activity; 5) an assessment of any significant changes in anthropogenic emissions; 6) an assessment of whether the current plan is sufficient to meet established reasonable progress goals; and 7) a review of Texas' visibility monitoring strategy and any necessary modifications [40 CFR §51.308(g)(1)-(7)].

**C.) Additional staff recommendations that are not required by federal rule or state statute:**
None

**Statutory authority:**
Texas Health and Safety Code (THSC), §382.002, Policy and Purpose; §382.011, General Powers and Duties; §382.012, State Air Control Plan; FCAA, §§110(a)(2)(D)(i)(II); 169A and 169B [42 U.S.C., §§7410(a)(2)(D)(i)(II); 7491 and 7492].

Re: Docket No. 2013-0595-SIP

**Effect on the:**

**A.) Regulated community:**
If the commission determines that additional emission reductions for visibility are needed, the effects of these reductions will need to be assessed.

**B.) Public:**
Continued visibility improvement is anticipated in Texas Class I areas and other states' Class I areas that Texas may impact.

**C.) Agency programs:**
None

**Planned public involvement:**
Texas is required to consult with the federal land managers (FLM) and the EPA. FLM consultations will be held after the proposal agenda and during the 60-day FLM review period. A public hearing will be held and a 30-day public comment period will be provided after the 60-day FLM review, as the Rule requires that the public have access to the FLMs' comments.

**Potential controversial concerns and legislative interest:**
The Rule requires Texas to set reasonable progress goals. FLMs may not agree with Texas about what is "reasonable" progress in reducing Texas visibility issues.

Also, the progress report that is required by the rule is based on an initial SIP revision that has not yet been approved by the EPA. If the EPA disapproves any part of the 2009 regional haze SIP revision, it could conflict with the progress report's conclusions that additional controls are unnecessary, and therefore be subject to EPA disapproval.

On April 12, 2013, the EPA issued guidance to the states on the required elements for five-year progress reports. This guidance was received by TCEQ after work began on this progress report SIP revision. Because of the late release of the guidance, staff was unable to use it in the development of this proposed SIP revision. The EPA may comment that changes need to be made to the proposed SIP revision based on the guidance; however, staff does not expect any changes to affect the conclusions of the proposal.

**Will this SIP revision affect any current policies or require development of new policies?**
No

**What are the consequences if this SIP does not go forward? Are there alternatives to this SIP revision?**
Not adopting and submitting this SIP revision to EPA could lead to a Finding of Failure to Submit by the EPA and could lead to federal sanctions such as emission offsets, highway

funding sanctions, or a FIP if the TCEQ does not correct the deficiency. Since the regional haze SIP revision includes the entire state, penalties could occur statewide.

**Key points in the proposal schedule:**

**Anticipated proposal date:** June 18, 2013
**Anticipated** *Texas Register* **publication date:** July 5, 2013
**Public hearing date:** September 24, 2013
**Federal Land Managers 60-day comment period:** June 19, 2013 through August 20, 2013
**Public comment period:** August 21, 2013 through October 1, 2013
**Anticipated adoption date:** February 5, 2014

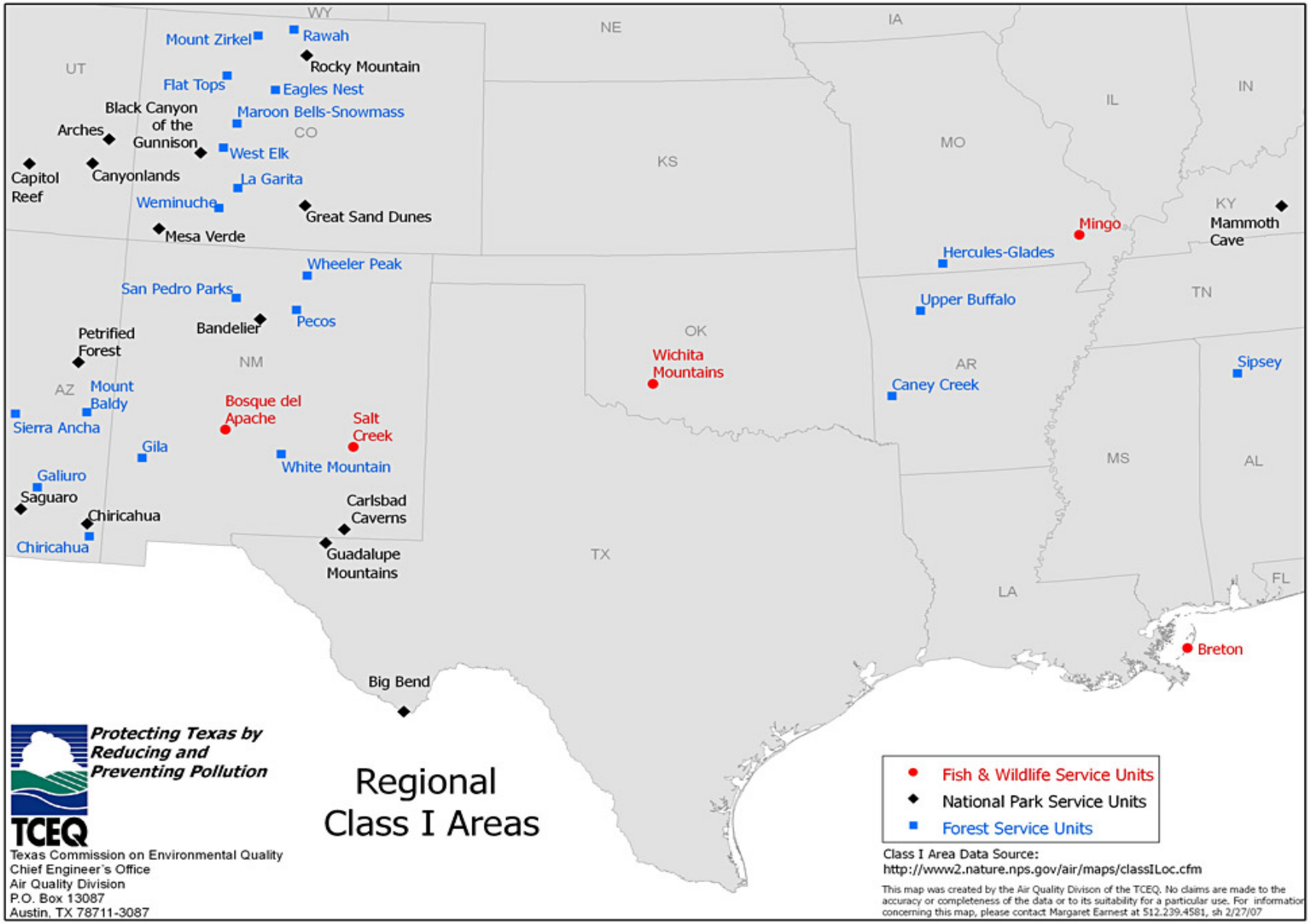
**Agency contacts:**

Margaret Earnest, Project Manager, 239-4581, Office of Air
John Minter, Staff Attorney, 239-0663

**Attachment**

Map of regional Class I areas

cc: Chief Clerk, 2 copies
Executive Director's Office
Curtis Seaton
Tucker Royall
Office of General Counsel
Margaret Earnest




Texas Commission on Environmental Quality
Chief Engineer's Office
Air Quality Division
P.O. Box 13087
Austin, TX 78711-3087

REVISIONS TO THE STATE OF TEXAS AIR QUALITY
IMPLEMENTATION PLAN CONCERNING
REGIONAL HAZE

FIVE-YEAR REGIONAL HAZE PROGRESS REPORT

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087
AUSTIN, TEXAS 78711-3087

# 2014 FIVE-YEAR REGIONAL HAZE STATE IMPLEMENTATION PLAN REVISION

Project Number 2013-013-SIP-NR

Proposal
June 18, 2013

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## EXECUTIVE SUMMARY

The Federal Clean Air Act (FCAA), §169A and B requires the United States Environmental Protection Agency (EPA) to adopt regulations and states to submit state implementation plan (SIP) revisions to reduce visibility impairment resulting "from man-made air pollution," known as regional haze, in 156 mandatory Class I federal areas (Class I areas). The FCAA requires each regional haze SIP revision include control measures, including Best Available Retrofit Technology (BART), to make reasonable progress toward the national goal of natural visibility conditions at all Class I areas by 2064. The two Class I areas in Texas are Big Bend and Guadalupe Mountains National Parks. Each state bordering Texas has one or more Class I areas designated for visibility protection. Texas' regional haze SIP must examine measures to reduce Texas' visibility impacts in Class I areas in other states.

The EPA adopted Regional Haze Regulations (the Rule) in 40 Code of Federal Regulations (CFR) Part 51, Subpart P, on July 1, 1999 and adopted amendments to Subpart P and a new Appendix Y (BART guidelines) to Part 51 on July 6, 2005. The Rule encourages states to work together in regional partnerships to reduce haze. There are five regional planning organizations in the United States. Texas is a member of the Central States Air Resource Agencies (CenSARA), which includes eight states: Texas, Louisiana, Oklahoma, Arkansas, Kansas, Missouri, Nebraska, and Iowa. In preparing its 2009 regional haze SIP revision, Texas coordinated with the states in the Central States Regional Air Planning Association (CENRAP). At the time the 2009 regional haze SIP revision was adopted, CENRAP included Minnesota; however, Minnesota subsequently left CENRAP and joined the Lake Michigan Air Directors Consortium. CENRAP subsequently has ceased to function and Texas is communicating through CenSARA with the remaining states that previously comprised CENRAP.

The Rule requires states to submit progress reports for each Class I area in the state in the form of SIP revisions every five years [40 CFR §51.308(g)(1)-(7)]. According to the Rule, the deadline for Texas to submit a five-year regional haze SIP revision is March 19, 2014, five years after submittal of the initial regional haze SIP revision. Section 51.308(g) provides that the report must evaluate "progress towards the reasonable progress goal for each Class I area located within the state and in each Class I area outside the state which may be affected by emissions from within the state." The Rule requires the revision to contain seven minimum elements: 1) the status of control measures included in the plan; 2) a summary of emissions reductions achieved from the plan; 3) an assessment of visibility conditions and changes for each Class I area in Texas and that Texas may impact; 4) an analysis of emissions reductions by pollutant, identified by source or activity; 5) an assessment of any significant changes in anthropogenic emissions; 6) an assessment of whether the current plan is sufficient to meet established reasonable progress goals; and 7) a review of Texas' visibility monitoring strategy and any necessary modifications. On April 12, 2013, the EPA released a guidance document to assist states in addressing the requirements for a five-year regional haze SIP revision [*General Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and EPA Regional Offices in Development and Review of the Progress Reports)*].

The Texas 2009 regional haze SIP revision relied on Clean Air Interstate Rule (CAIR) nitrogen oxides ($NO_X$) and sulfur dioxide ($SO_2$) emission reductions that the EPA determined were "better than BART" for emissions reductions from electric generating units (EGU). Texas' 2009 regional haze SIP revision projected that the two Class I areas in Texas will not meet the federal goal of natural visibility conditions by 2064 largely because of international transport of visibility impairing pollutants into Texas across its southern border. However, Texas projects

that it will meet the established reasonable progress goals set by the state for 2018 for all Class I areas it affects. The EPA has not fully acted on Texas' regional haze SIP revision submission. According to an amended consent decree, the EPA must make a final determination on the Texas 2009 regional haze SIP revision by December 13, 2014.

On December 30, 2011, the EPA issued notice to Texas (and other states) that because the states' regional haze SIP revisions relied on CAIR to satisfy certain emission reduction requirements, the EPA was proposing a limited disapproval of the states' SIP revisions and a federal implementation plan (FIP) to replace reliance on CAIR with reliance on the Cross-State Air Pollution Rule (CSAPR). On June 7, 2012, the EPA published final, limited disapproval for the part of the Texas 2009 regional haze SIP revision that relied on CAIR but did not simultaneously finalize a FIP that would have replaced CAIR with CSAPR for Texas (77 Federal Register 33642). The FIP was not finalized to allow the EPA more time to assess the full Texas 2009 regional haze SIP revision. On August 21, 2012, the United States Court of Appeals for the District of Columbia vacated CSAPR and determined that CAIR will remain in place until the EPA develops a valid replacement rule. The EPA requested a rehearing *en banc*, which the Court denied on January 24, 2013. On March 29, 2013, the EPA filed a petition for certiorari with the Supreme Court seeking review of the D.C. Circuit's opinion. The EPA issued a memo on November 19, 2012 to assist states and the EPA regional offices in determining how the court-ordered vacatur of CSAPR will impact the EPA's limited disapproval and FIPs for regional haze. With respect to the disapproval for Texas' regional haze SIP revision, the memo states the EPA plans to "await the decision on [the] petition for rehearing," rather than make a decision to "revisit" its decision. The EPA's memo also suggested states and the agency move forward as if a federal trading program will be functioning after court suits are settled. Therefore, Texas will continue to apply EPA's technical determination that CAIR is "better than BART."

Section 51.308(h) requires the progress report to include a negative declaration that further revision of the existing SIP is not needed at this time, if it is determined that the existing plan requires no further substantive revision to achieve established goals for visibility improvement and emissions reductions. If progress is inadequate, then the regional haze SIP revision must be revised to address deficiencies.

Based on the analyses conducted, Texas has determined that the existing regional haze SIP revision is adequate for continued progress toward the established reasonable progress goals for the Class I areas in Texas and for Class I areas in other states impacted by Texas emissions. Texas has determined that revisions of the existing regional haze SIP are not needed at this time to meet the requirements of the Rule. The state will continue implementation of control measures included in the 2009 regional haze SIP revision. The next scheduled regional haze SIP revision is due by July 31, 2018.

Per the Rule requirements, Texas submits a negative declaration, which determines that its regional haze SIP is sufficient, based on the evidence in this SIP revision and the federal analysis documented in the 2011 Interagency Monitoring of Protected Visual Environments (IMPROVE) report. Texas also determines that no additional controls are necessary based on this five-year progress report.

However, improvements in visibility at Big Bend and Guadalupe Mountains National Parks are substantially dependent upon reducing emissions from Mexico and Central America. The TCEQ, in its 2009 regional haze SIP submittal, specifically asked the EPA for federal efforts to reduce the international transport impacts on regional haze coming into the United States across Texas' southern border. Modeling estimates indicate that 52% of the visibility impairment at Big Bend National Park and 20% of the visibility impairment at Guadalupe Mountains National Park on

the 20% of days with the greatest visibility impairment comes from international transport. The preamble to the July 1, 1999, issuance of the Rule clearly says that states are not required to carry out compensatory over control to make up for the lack of progress in reducing the impacts of international transport. In this SIP submittal, the TCEQ reiterates its request to the EPA to initiate efforts to secure international emission reductions to reduce visibility impairment at Texas' Class I areas.

## SECTION V-A: LEGAL AUTHORITY

A. General

The Texas Commission on Environmental Quality (TCEQ) has the legal authority to implement, maintain, and enforce the National Ambient Air Quality Standards (NAAQS) and to control the quality of the state's air, including maintaining adequate visibility.

The first air pollution control act, known as the Clean Air Act of Texas, was passed by the Texas Legislature in 1965. In 1967, the Clean Air Act of Texas was superseded by a more comprehensive statute, the Texas Clean Air Act (TCAA), found in Article 4477-5, Vernon's Texas Civil Statutes. The legislature amended the TCAA in 1969, 1971, 1973, 1979, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, and 2011. In 1989, the TCAA was codified as Chapter 382 of the Texas Health and Safety Code.

Originally, the TCAA stated that the Texas Air Control Board (TACB) is the state air pollution control agency and is the principal authority in the state on matters relating to the quality of air resources. In 1991, the legislature abolished the TACB effective September 1, 1993, and its powers, duties, responsibilities, and functions were transferred to the Texas Natural Resource Conservation Commission (TNRCC). With the creation of the TNRCC, the authority over air quality is found in both the Texas Water Code and the TCAA. Specifically, the authority of the TNRCC is found in Chapters 5 and 7. Chapter 5, Subchapters A - F, H - J, and L, include the general provisions, organization, and general powers and duties of the TNRCC, and the responsibilities and authority of the executive director. Chapter 5 also authorizes the TNRCC to implement action when emergency conditions arise and to conduct hearings. Chapter 7 gives the TNRCC enforcement authority. In 2001, the 77th Texas Legislature continued the existence of the TNRCC until September 1, 2013, and changed the name of the TNRCC to the TCEQ. In 2009, the 81st Texas Legislature, during a special session, amended section 5.014 of the Texas Water Code, changing the expiration date of the TCEQ to September 1, 2011, unless continued in existence by the Texas Sunset Act. The 82nd Texas Legislature, 2011, Regular Session, continued the existence of the TCEQ until 2023.

The TCAA specifically authorizes the TCEQ to establish the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general, comprehensive plan. The TCAA, Subchapters A - D, also authorize the TCEQ to collect information to enable the commission to develop an inventory of emissions; to conduct research and investigations; to enter property and examine records; to prescribe monitoring requirements; to institute enforcement proceedings; to enter into contracts and execute instruments; to formulate rules; to issue orders taking into consideration factors bearing upon health, welfare, social and economic factors, and practicability and reasonableness; to conduct hearings; to establish air quality control regions; to encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the federal government; and to establish and operate a system of permits for construction or modification of facilities.

Local government authority is found in Subchapter E of the TCAA. Local governments have the same power as the TCEQ to enter property and make inspections. They also may make recommendations to the commission concerning any action of the TCEQ that affects their territorial jurisdiction, may bring enforcement actions, and may execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA and the rules or orders of the commission.

Subchapters G and H of the TCAA authorize the TCEQ to establish vehicle inspection and maintenance programs in certain areas of the state, consistent with the requirements of the Federal Clean Air Act; coordinate with federal, state, and local transportation planning agencies to develop and implement transportation programs and measures necessary to attain and maintain the NAAQS; establish gasoline volatility and low emission diesel standards; and fund and authorize participating counties to implement vehicle repair assistance, retrofit, and accelerated vehicle retirement programs.

B. Applicable Law

The following statutes and rules provide necessary authority to adopt and implement the state implementation plan (SIP). The rules listed below have previously been submitted as part of the SIP.

Statutes

All sections of each subchapter are included, unless otherwise noted.

| | |
|---|---|
| TEXAS HEALTH & SAFETY CODE, Chapter 382 | September 1, 2011 |
| TEXAS WATER CODE | September 1, 2011 |

Chapter 5: Texas Natural Resource Conservation Commission
- Subchapter A: General Provisions
- Subchapter B: Organization of the Texas Natural Resource Conservation Commission
- Subchapter C: Texas Natural Resource Conservation Commission
- Subchapter D: General Powers and Duties of the Commission
- Subchapter E: Administrative Provisions for Commission
- Subchapter F: Executive Director (except §§5.225, 5.226, 5.227, 5.2275,5.231, 5.232, and 5.236)
- Subchapter H: Delegation of Hearings
- Subchapter I: Judicial Review
- Subchapter J: Consolidated Permit Processing
- Subchapter L: Emergency and Temporary Orders (§§5.514, 5.5145, and 5.515 only)
- Subchapter M: Environmental Permitting Procedures (§5.558 only)

Chapter 7: Enforcement
- Subchapter A: General Provisions (§§7.001, 7.002, 7.0025, 7.004, and 7.005 only)
- Subchapter B: Corrective Action and Injunctive Relief (§7.032 only)
- Subchapter C: Administrative Penalties
- Subchapter D: Civil Penalties (except §7.109)
- Subchapter E: Criminal Offenses and Penalties: §§7.177, 7.179-7.183

Rules

All of the following rules are found in 30 Texas Administrative Code, as of the following latest effective dates:

| | |
|---|---|
| Chapter 7: Memoranda of Understanding, §§7.110 and 7.119 | December 13, 1996 and May 2, 2002 |
| Chapter 19: Electronic Reporting | March 15, 2007 |
| Chapter 35: Subchapters A-C, K: Emergency and Temporary Orders and Permits; Temporary Suspension or Amendment of Permit Conditions | July 20, 2006 |

| | |
|---|---|
| Chapter 39: Public Notice, §§39.402(a)(1) - (6), (8), and (10) - (12), 39.405(f)(3) and (g), (h)(1)(A) - (4), (6), (8) - (11), (i) and (j), 39.407, 39.409, 39.411(a), (e)(1) - (4)(A)(i) and (iii), (4)(B), (5)(A) and (B), and (6) - (10), (11)(A)(i) and (iii) and (iv), (11)(B ) - (F), (13) and (15), and (f)(1) - (8), (g) and (h), 39.418(a), (b)(2)(A), (b)(3), and (c), 39.419(e), 39.420 (c)(1)(A) - (D)(i)(I) and (II), (D)(ii), (c)(2), (d) - (e), and (h), and 39.601 - 39.605 | June 24, 2010 |
| Chapter 55: Requests for Reconsideration and Contested Case Hearings; Public Comment, §§55.150, 55.152(a)(1), (2), (5), and (6) and (b), 55.154(a), (b), (c)(1) - (3), and (5), and (d) - (g), and 55.156(a), (b), (c)(1), (e), and (g) | June 24, 2010 |
| Chapter 101: General Air Quality Rules | April 19, 2012 |
| Chapter 106: Permits by Rule, Subchapter A | May 15, 2011 |
| Chapter 111: Control of Air Pollution from Visible Emissions and Particulate Matter | February 16, 2012 |
| Chapter 112: Control of Air Pollution from Sulfur Compounds | July 16, 1997 |
| Chapter 113: Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants | May 14, 2009 |
| Chapter 114: Control of Air Pollution from Motor Vehicles | September 13, 2012 |
| Chapter 115: Control of Air Pollution from Volatile Organic Compounds | December 29, 2011 |
| Chapter 116: Permits for New Construction or Modification | August 16, 2012 |
| Chapter 117: Control of Air Pollution from Nitrogen Compounds | April 19, 2012 |
| Chapter 118: Control of Air Pollution Episodes | March 5, 2000 |
| Chapter 122: §122.122: Potential to Emit | December 11, 2002 |
| Chapter 122: §122.215: Minor Permit Revisions | June 3, 2001 |
| Chapter 122: §122.216: Applications for Minor Permit Revisions | June 3, 2001 |
| Chapter 122: §122.217: Procedures for Minor Permit Revisions | December 11, 2002 |
| Chapter 122: §122.218: Minor Permit Revision Procedures for Permit Revisions Involving the Use of Economic Incentives, Marketable Permits, and Emissions Trading | June 3, 2001 |

## SECTION VI: CONTROL STRATEGY

A. Introduction (No change)
B. Ozone (No change)
C. Particulate Matter (No change)
D. Carbon Monoxide (No change)
E. Lead (No change)
F. Oxides of Nitrogen (No change)
G. Sulfur Dioxide (No change)
H. Conformity with the National Ambient Air Quality Standards (No change)
I. Site Specific (No change)
J. Mobile Sources Strategies (No change)
K. Clean Air Interstate Rule (No change)
L. Transport (No change)
M. Regional Haze (Revised)

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## LIST OF ACRONYMS

| | |
|---|---|
| AD | Attainment Demonstration |
| AFFP | Alternative Fueling Facilities Program |
| ARRA | American Recovery and Reinvestment Act |
| ARD | Acid Rain Database |
| BART | Best Available Retrofit Technology |
| CAIR | Clean Air Interstate Rule |
| CEED | Center for Energy and Economic Development |
| CENRAP | Central Regional Air Planning Association |
| CenSARA | Central States Air Resource Agencies |
| CFR | Code of Federal Regulations |
| CNG | Compressed natural gas |
| CO | Carbon monoxide |
| CSAPR | Cross State Air Pollution Rule |
| CSN | Chemical Speciation Network |
| CTT | Clean Transportation Triangle |
| D.C. | District of Columbia |
| DFW | Dallas-Fort Worth |
| dv | deciview |
| EGU | electric generating unit |
| EI | Emissions inventory |
| EIQ | Emissions inventory questionnaires |
| ENVIRON | ENVIRON International Corporation |
| EPA | United States Environmental Protection Agency |
| ESL | Energy Systems Laboratory at Texas A&M University |
| ERIG | Emissions Reduction Incentive Grants Program |
| FCAA | Federal Clean Air Act |
| FDG | flue gas desulfurization |
| FIP | federal implementation plan |
| FLM | Federal Land Manager |
| FMVCP | Federal Motor Vehicle Control Program |
| FWS | Fish and Wildlife Service, United States Department of Interior |
| FS | Forest Service, United States Department of Agriculture |
| FY | Fiscal Year |

| | |
|---|---|
| g/hp-hr | grams per horsepower-hour |
| HAP | hazardous air pollutants |
| HB | House Bill |
| HGB | Houston-Galveston-Brazoria |
| hp | horsepower |
| IMPROVE | Interagency Monitoring of Protected Visual Environments |
| LADCO | Lake Michigan Air Directors Consortium |
| lb/MMBtu | pound per million British thermal units |
| LIRAP | Low Income Vehicle Repair Assistance, Retrofit, and Accelerated Vehicle Retirement Program |
| LNG | Liquefied natural gas |
| MANE-VU | Mid-Atlantic/Northeast Visibility Union |
| MARAMA | Mid-Atlantic Regional Air Management Association |
| MATS | Mercury And Air Toxics Standards Rule |
| MECT | Mass Emissions Cap and Trade |
| MJO | Multi-Jurisdictional Organization |
| MOVES | Motor Vehicle Emission Simulator model |
| MRPO | Midwest Regional Planning Organization |
| NAAQS | National Ambient Air Quality Standard |
| NEI | National Emissions Inventory |
| NESCAUM | Northeast States for Coordinated Air Use Management |
| NESHAP | National Emission Standards for Hazardous Air Pollutant |
| $NH_3$ | Ammonia |
| NLEV | National Low Emission Vehicle |
| $NO_2$ | Nitrogen dioxide |
| $NO_X$ | Nitrogen oxides |
| NPS | National Park Service, United States Department of Interior |
| NTIG | New Technology Implementation Grants Program |
| NTRD | New Technology Research and Development Program |
| PEI | Periodic emissions inventory |
| PM | Particulate matter |
| $PM_{2.5}$ | Particulate matter with diameter of 2.5 micrometers or less or fine PM |
| $PM_{10}$ | Particulate matter with diameter of 10 micrometers or less |
| ppb | parts per billion |
| ppm | parts per million |

| | |
|---|---|
| PUC | Public Utility Commission |
| RPG | Reasonable progress goal |
| RFG | reformulated gasoline |
| RPO | Regional Planning Organization |
| SB | Senate Bill |
| SECO | State Energy Conservation Office |
| SESARM | Southeastern States Air Resource Managers |
| SIP | state implementation plan |
| $SO_2$ | Sulfur dioxide |
| SLAMS | State and local air monitoring station |
| STN | Speciation Trends Network |
| TAC | Texas Administrative Code |
| TACB | Texas Air Control Board |
| TCAA | Texas Clean Air Act |
| TCEQ | Texas Commission on Environmental Quality (commission) |
| TEOM | Tapered element oscillating microbalance |
| TERP | Texas Emission Reduction Plan |
| TexN | Texas NONROAD model |
| TNGVGP | Texas Natural Gas Vehicle Grants Program |
| TNRCC | Texas Natural Resource Conservation Commission |
| TOG | Total organic gas |
| tpd | tons per day |
| tpy | tons per year |
| TUC | Texas Utilities Code |
| TxDOT | Texas Department of Transportation |
| TxLED | Texas Low Emission Diesel |
| $\mu g/m^3$ | microgram per cubic meter |
| U.S.C. | United States Code |
| URP | Uniform rate of progress |
| VIEWS | Visibility Information Exchange Web System |
| VISTAS | Visibility Improvement State and Tribal Association of the Southeast |
| VOC | volatile organic compounds |
| WESTAR | Western States Air Resource Council |
| WRAP | Western Regional Air Partnership |

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# CHAPTER 1: FEDERAL REGIONAL HAZE PROGRAM REQUIREMENTS

## 1.1 BACKGROUND

In amendments to the Federal Clean Air Act (FCAA) in 1977, Congress added §169 [42 United States Code (U.S.C.) 7491] setting forth the following national visibility goal of restoring pristine conditions in national parks and wilderness areas:

> "Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution."

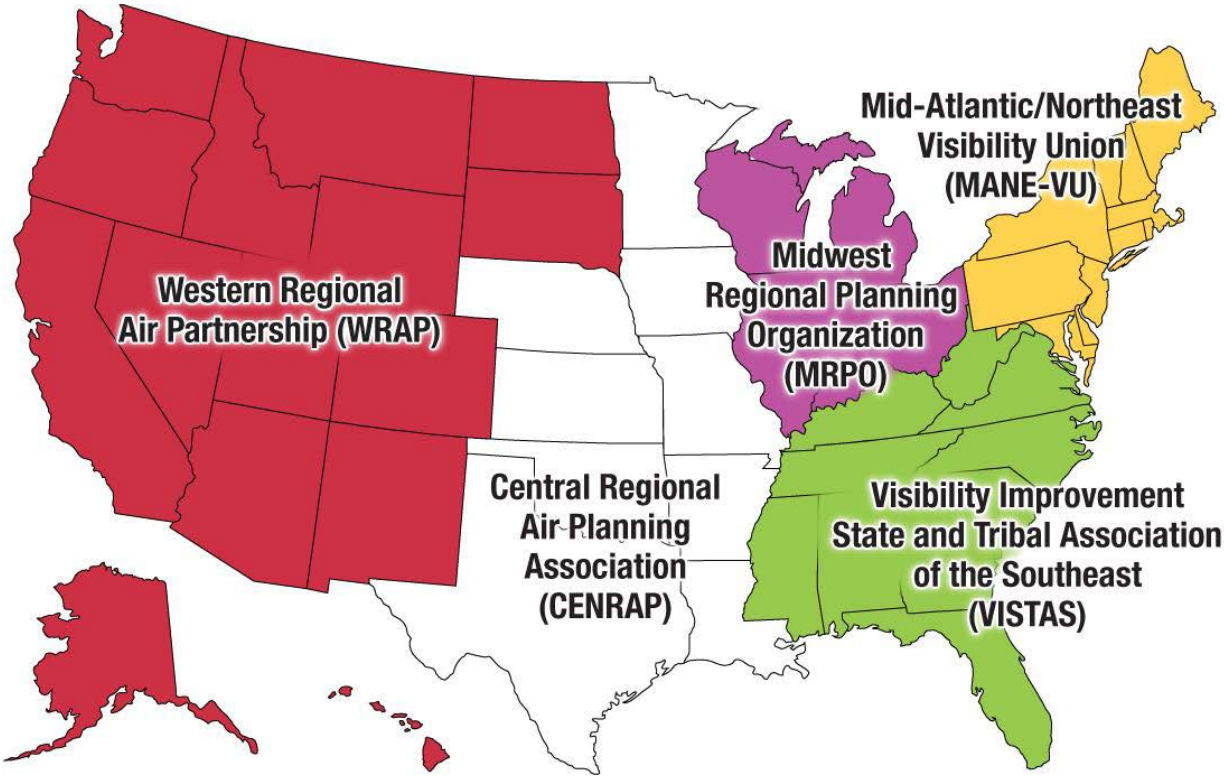
When the FCAA was amended in 1990, Congress added §169B (42 U.S.C. 7492), authorizing further research and regular assessments of the progress to improve visibility in the mandatory Class I federal areas (Class I areas). Figure 1-1: *Map of 156 Mandatory Class I Federal Areas* shows the location of the Class I areas of concern and which federal land manager (FLM) is responsible for each area around the nation. For Texas and surrounding states, the three FLMs are the National Park Service, the Fish and Wildlife Service, and the Forest Service.


Note: NPS – National Park Service, FWS –Fish and Wildlife Service, FS – Forest Service
Source: www.epa.gov/visibility/program.html

**Figure 1-1: Map of 156 Mandatory Class I Federal Areas**

## 1.2 REGIONAL PLANNING

Following the United States Environmental Protection Agency's (EPA) adoption of its regional haze rule (Rule) in July 1999, the EPA designated five Regional Planning Organizations (RPO) to assist with the coordination and cooperation states and tribes needed to address the visibility issue. Figure 1-2: *Map of the Regional Planning Organizations* shows the locations of the five RPOs.




Source: www.epa.gov/visibility/regional.html

**Figure 1-2: Map of the Regional Planning Organizations**

Using federal funds available to them, the RPOs developed a wide array of technical products for their member and non-member states, including updated emissions inventories, additional monitoring to help answer questions related to visibility impacts, and modeling to help determine which pollutants should be the focus for control measures. The RPOs were also key to coordination and consultation efforts among states, tribes, FLMs, and the EPA. The products and efforts of the RPOs culminated in the state implementation plans (SIP) submitted to the EPA. RPO funding ceased in 2011 and multi-jurisdictional organizations (MJO), such as the Central States Air Resource Agencies (CenSARA), currently manage and coordinate multi-state air quality technical projects. Because of directed funding, tribes and FLMs are not members of MJOs, though communication and coordination with these entities is still an important component of regional haze work.

The EPA's Regional Haze Program has been the subject of litigation, making it difficult to determine what control measures could be included in SIPs and to complete the initial SIPs in a timely manner. On May 24, 2002, the United States Court of Appeals for the District of Columbia (D.C.) Circuit issued a ruling vacating the Rule in part and sustaining it in part, based

on a finding that EPA's prescribed methods for determining Best Available Retrofit Technology (BART) were inconsistent with the FCAA [*American Corn Growers Ass'n v. EPA*, 291 F.3d 1 (D.C. Cir. 2002)]. On February 18, 2005, the D.C. Circuit decided another case dealing with BART and a BART alternative program, *Center for Energy and Economic Development (CEED) v. EPA*, 398 F.3d 653, (D.C. Cir., 2005). CEED affirmed EPA's interpretation of FCAA 169A (b)(2) as allowing for non-BART alternatives where those alternatives make greater progress than BART. The EPA promulgated a rule on July 6, 2005, entitled *Regional Haze Regulations and Guidelines for BART Determinations* (70 *Federal Register* (FR) 39104) to assist states in identifying which of their BART-eligible sources should undergo a BART analysis (i.e., which are sources subject to BART) and select appropriate controls (the BART determination).

Around the same time, the EPA issued the Clean Air Interstate Rule (CAIR) on May 12, 2005, (70 FR 25162), which states could implement in lieu of BART. The rule affected 28 states and the District of Columbia and included a cap and trade program targeting sulfur dioxide ($SO_2$) and nitrogen oxides ($NO_X$). In July 2008, the Court found CAIR and EPA's CAIR federal implementation plans, or FIPs, unlawful [*North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008)], and modified on rehearing [*North Carolina v. EPA*, 550 F.3d 1176, 1178 (D.C. Cir. 2008)]. The ruling remanded CAIR to the EPA, though leaving existing CAIR programs in place while directing EPA to replace them as rapidly as possible with a new rule consistent with the FCAA.

The new rule, the Cross State Air Pollution Rule (CSAPR), was proposed July 6, 2010. The program applied to 31 states and the District of Columbia. Some states were included for ozone season via $NO_X$ or particulate matter with diameter of 2.5 micrometers or less ($PM_{2.5}$) via $SO_2$ and $NO_X$ or both ozone and $PM_{2.5}$. CSAPR was finalized on July 6, 2011. CSAPR was scheduled to replace CAIR starting January 1, 2012.

On December 30, 2011, the EPA issued notice to Texas (and other states) that because the states' regional haze SIP revisions relied on CAIR to satisfy certain emission reduction requirements, the EPA was proposing a limited disapproval of the states' SIP revisions and a federal implementation plan (FIP) to replace reliance on CAIR with reliance on the Cross-State Air Pollution Rule (CSAPR). On June 7, 2012, the EPA published final, limited disapproval for the part of the Texas 2009 regional haze SIP revision that relied on CAIR but did not simultaneously finalize a FIP that would have replaced CAIR with CSAPR for Texas (77 Federal Register 33642). The FIP was not finalized to allow the EPA more time to assess the full Texas 2009 regional haze SIP revision. On August 21, 2012, the United States Court of Appeals for the District of Columbia vacated CSAPR and determined that CAIR will remain in place until the EPA develops a valid replacement rule. The EPA requested a rehearing *en banc*, which the Court denied on January 24, 2013. On March 29, 2013, the EPA filed a petition for certiorari with the Supreme Court seeking review of the D.C. Circuit's opinion. The EPA issued a memo on November 19, 2012 to assist states and the EPA regional offices in determining how the court-ordered vacatur of CSAPR will impact the EPA's proposed limited disapproval and FIP for regional haze. With respect to the disapproval for Texas' regional haze SIP revision, the memo states the EPA plans to "await the decision on [the] petition for rehearing," rather than make a decision to "revisit" its decision. The EPA's memo also suggested states and the agency move forward as if a federal trading program will be functioning after court suits are settled. Therefore, Texas will continue to apply EPA's technical determination that CAIR is "better than BART."

The EPA is scheduled to propose action on Texas regional haze SIP in May 2014 and make a final determination on the SIP by December 13, 2014.

## 1.3 REQUIREMENTS FOR PERIODIC REPORTS

Pursuant to the requirements of 40 Code of Federal Regulations (CFR) §51.308(g), (h), and (i), Texas will submit this five-year progress report as a SIP revision, after notice and comment, and as adopted by the Texas Commission on Environmental Quality (TCEQ). Texas proposes this SIP revision in accordance with state laws and rules.

The progress report must contain at a minimum: 1) the status of control measures included in the plan; 2) a summary of emissions reductions achieved from the plan; 3) an assessment of visibility conditions and changes for each Class I area in Texas and that Texas may impact; 4) an analysis of emissions reductions by pollutant, identified by source or activity; 5) an assessment of any significant changes in anthropogenic emissions; 6) an assessment of whether the current plan is sufficient to meet established reasonable progress goals; and, 7) a review of Texas' visibility monitoring strategy and any necessary modifications [40 CFR §51.308(g)(1)-(7)].

## 1.4 PUBLIC HEARINGS

Per 40 CFR §51.308(g), this submittal also complies with 40 CFR §51.102 and §51.103 to offer the public the opportunity to request a hearing and comment on a proposed SIP revision. Texas will provide public notice of the opportunity to comment on the SIP revision by August 2013. The commission will offer a public hearing in Austin on September 24, 2013. The public hearing will be held in Building E, Room 201S on the second floor of the TCEQ main headquarters campus, 12100 Park 35 Circle, Austin, Texas 78753. Notification of the meeting will be sent out through TCEQ's e-mail group, which requires individual sign-up (https://public.govdelivery.com/accounts/TXTCEQ/subscriber/new). For updates, the public may also check the TCEQ's current internet calendar (www.tceq.texas.gov/events) or the SIP Hot Topics Web page (www.tceq.texas.gov/airquality/sip/Hottop.html).

The 30-day public comment period is scheduled to be open from August 21, 2013 and to close on October 1, 2013. Notice of public hearing for this SIP revision will be published in the *Texas Register* and local papers in Austin, Fort Worth, El Paso, and Houston. Written comments will be accepted through the eComments system, via mail, or fax. All comments should reference the "2014 Five-Year Regional Haze SIP Revision" and Project Number 2013-013-SIP-NR. Comments may be submitted to Margaret Earnest, MC 206, SIP Team, Office of Air, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087 or faxed to (512) 239-6188. If you choose to submit electronic comments, they must be submitted through the eComments (http://www5.tceq.state.tx.us/rules/ecomments) system. File size restrictions may apply to comments being submitted via the eComments system. Comments must be received by October 1, 2013. Electronic comments are appreciated and time saving.

The public hearing transcript will be available at adoption. Chapter 8: *Consultation with Federal Land Managers* of this SIP describes the consultation process with other federal agencies and states that are additionally required for the regional haze SIP. FLMs are required to have a 60-day review period for this SIP revision before it goes for public review according to the regional haze rule (see Appendix A). FLM review is scheduled from June to August 2013. The FLMs' comments will be available on the TCEQ website for the public to review before the end of the public comment period.

# CHAPTER 2: STATUS OF CONTROL MEASURES AND EMISSIONS REDUCTIONS – 40 CFR §51.308(g)(1) AND (2)

## 2.1 INTRODUCTION

The regional haze rule (Rule) in 40 Code of Federal Regulations (CFR) §51.308(g) requires states to submit a report to the United States Environmental Protection Agency (EPA) evaluating progress towards the reasonable progress goals for mandatory Class I federal areas (Class I areas) located both within and outside of the state. 40 CFR §51.308(g)(1) requires a description of the status of implementation of control measures included in the Texas 2009 Revisions to the State Implementation Plan (SIP) Concerning Regional Haze, or 2009 regional haze SIP revision, for achieving reasonable progress goals for Class I areas both within and outside the state. 40 CFR §51.308(g)(2) requires a summary of the emissions reductions achieved from implementing the control measures in the 2009 regional haze SIP revision. This chapter provides the updates for 40 CFR §51.308(g)(1) and (2).

## 2.2 BEST AVAILABLE RETROFIT TECHNOLOGY POSTSCRIPT

The EPA's 1999 Rule required the installation of Best Available Retrofit Technology (BART) or equivalent emission controls for emission sources constructed before 1977 that were not regulated under subsequent provisions of the Federal Clean Air Act (FCAA) (EPA 2005a). The 2009 regional haze SIP revision described the Texas Commission on Environmental Quality's (TCEQ) evaluation of the 26 stationary point sources that may be subject to the BART requirements (Secretary of State 2007). Texas chose to participate in the EPA's Clean Air Interstate Rule (CAIR) is "better than BART" option (EPA 2005b). The EPA guidance identifies CAIR emissions reductions as greater than BART for electric generating units (EGU), therefore relieving EGUs from a BART analysis for sulfur dioxide ($SO_2$) and nitrogen oxides ($NO_X$).

After potential sources completed a BART survey, Texas ascertained approximately 125 potential sources that were BART-eligible (www.tceq.texas.gov/assets/public/implementation/air/sip/haze/App9_3_bartsurvey.pdf). Approximately 70 sources modeled out of BART through TCEQ group modeling. Modeling analyses were used to screen out sources that were shown to contribute less that 0.5 deciviews of visibility impact at nearby Class I areas. These sources were required to certify that the TCEQ data were accurate. Approximately 20 potentially BART-eligible sources changed their emission rate inputs in the BART survey; some sources changed their permits and reduced their potential to emit below the threshold, and other sources shut down their older BART equipment. Approximately 35 potentially BART-eligible sources were required by the BART rule to do further modeling; none of the individual modeling reports were above the 0.5 deciview BART-eligible threshold (TCEQ 2013a). As part of the 2009 regional haze SIP revision, the TCEQ concluded that no sources in Texas were subject to BART requirements. The 2009 regional haze SIP revision Chapter 9: *Best Available Retrofit Technology* provides a discussion on this conclusion (TCEQ 2009).

## 2.3 FEDERAL CONSENT DECREES

The TCEQ considered unit specific requirements from several federal consent decrees applicable to refineries, EGUs and other sources. The decrees that follow are in addition to the 2009 federal agreements that were included in the previous modeling for the 2009 regional haze SIP revision, which did not include the coal-fired power plant consent decrees or the settlement with Owens-Brockway Glass Container, Inc.

Additionally, national reductions of visibility-impairing pollutants are a co-benefit of these multi-pollutant reductions by numerous federal initiatives. Texas anticipates improvement in its Class I areas as well as in the Class I areas of our surrounding states due to these federal decrees.

### 2.3.1 Reductions under the EPA Coal-Fired Power Plant Consent Decrees

The EPA coal-fired power plant enforcement initiative addressed both $SO_2$ and $NO_X$. The EPA has provided specifics of the $SO_2$ and $NO_X$ reductions by emission point for coal-fired power plants. Although the enforcement initiative did not target any coal-fired power plants in Texas, it did address one non-utility source category site in Texas. In 2003, Alcoa Inc. entered into an agreement with the EPA for its Rockdale facility to address $SO_2$ and $NO_X$ emissions from its three coal-fired electric generating industrial boilers that support the smelter operations at Rockdale. Table 2-1: *Annual $SO_2$ and $NO_X$ Emissions at Coal-Fired Power Plants Consent Decree Affected Sources* shows annual emission reductions in tons per year (tpy) resulting from implementation of the federal decree.

**Table 2-1: Annual $SO_2$ and $NO_X$ Emissions at Coal-Fired Power Plants Consent Decree Affected Sources**

| Site | $NO_X$ Reduction (tpy) | Year to Initiate $NO_X$ Reductions | $SO_2$ Reductions (tpy) | Year to Initiate $SO_2$ Reductions |
|---|---|---|---|---|
| **Rockdale Facility** | 15,480 | 2009 | 52,900 | 2012 |

Source: www.epa.gov/compliance/resources/cases/civil/caa/alcoa.html

### 2.3.2 National $SO_2$ Reductions under the EPA Refinery Consent Decrees

The EPA's National Petroleum Refinery Initiative has resulted in multi-issue settlement agreements with the nation's major petroleum refineries. As of April 2012, over 100 United States refineries representing more than 90% of total domestic refining capacity are under settlement, and negotiations are underway with other refiners not currently under settlement. The EPA consent decrees limit emissions from fluidized catalytic cracking units, sulfur recovery units, heaters and boilers, and flares. The EPA estimates that full implementation of the current settlements will result in more than 92,000 tpy of $NO_X$ emission reductions nationwide. The EPA has provided specifics of the $SO_2$ reductions by emission point for refineries. Since the TCEQ's new and modified source permitting requirements prohibit an increase in allowable emissions without a construction permit, which requires use of Best Available Control Technology, the projected emission increases between 2002 and 2018 may be considerably over estimated. Still, 2002 pre-decree levels compared to 2018 post-decree levels are substantial.

Table 2-2: *Annual $SO_2$ Emissions at Refinery Consent Decree Impacted Sources* shows annual emissions reductions resulting from implementation of the federal decrees for all refineries in Texas as well as one large sulfuric acid plant at the western end of the Houston Ship Channel (see Appendix B: *Petroleum Refinery Consent Decree Emission Reduction Assessment for Ozone and Regional Haze SIPs*). The growth projected from 2002 through 2018 is an estimate from the Central Regional Air Planning Association's emission inventory contractor (Pechan 2005a-e).

**Table 2-2: Annual $SO_2$ Emission at Refinery Consent Decree Impacted Sources**

| $SO_2$ Emissions | 2002 (tpy) | 2018 (tpy) |
|---|---|---|
| **Pre-decree Levels** | 48,868 | 62,229 |
| **Reduction Estimate*** | 45,453 | 56,433 |
| **Difference (remaining emissions)** | 3,415 | 5,796 |

*Reductions estimate applied to 2002 actual emissions to show theoretical impact. Controls will be in place before 2018. Sources: www.epa.gov/compliance/resources/cases/civil/caa/oil/ and ENVIRON 2007

### 2.3.3 Owens-Brockway Glass Container Inc.

The EPA and the Oklahoma Department of Environmental Quality filed a complaint seeking civil penalties and injunctive relief from Owens-Brockway Glass Container Inc. (Owens) for alleged violations of the FCAA, with respect to emissions of $NO_X$, $SO_2$, and particulate matter (PM) at five of its glass container manufacturing facilities in Oklahoma, Georgia, Texas, and Pennsylvania (EPA 2012a).

On November 30, 2012 an EPA Notice and Finding of Violation was issued to Owens for violations at its container glass manufacturing plant located in McLennan County. Specifically, Owens violated the Prevention of Significant Deterioration and the New Source Review permitting requirements of the Texas SIP at its Waco, Texas facility. The three tables that follow show the emission controls and dates of compliance for the emissions of $NO_X$, $SO_2$, and PM (see Table 2-3: *$NO_X$ Emission Control Installation and Compliance Schedule for Owens*; Table 2-4: *$SO_2$ Emission Control Installation and Compliance Schedule for Owens*; and Table 2-5*: PM Emission Control Installation and Compliance Schedule for Owens*).

**Table 2-3: $NO_X$ Emission Control Installation and Compliance Schedule for Owens**

| Facility and Furnace | Control | Final $NO_X$ Emission Limit (lb $NO_X$/ton glass pulled) | Compliance Deadline |
|---|---|---|---|
| Waco Furnace A | Selective Catalytic Reduction (SCR) | 1.20 | May 1, 2014 |
| Waco Furnace B | SCR | 1.20 | May 1, 2015 |
| Waco Furnace D | SCR | 1.20 | June 1, 2013 |

Note: Each SCR must be designed to achieve a removal efficiency of at least 90%

**Table 2-4: $SO_2$ Emission Control Installation and Compliance Schedule for Owens**

| Facility and Furnace | Control | Final $SO_2$ Emission Limit (lb $SO_2$/ton glass pulled) | Compliance Deadline |
|---|---|---|---|
| Waco Furnace A | Dry Scrubber System | 0.80 | May 1, 2014 |
| Waco Furnace B | Dry Scrubber System | 0.80 | May 1, 2015 |
| Waco Furnace D | Dry Scrubber System | 0.80 | June 1, 2013 |

**Table 2-5: PM Emission Control Installation and Compliance Schedule for Owens**

| Facility and Furnace | Control | Final PM Emission Limits (lb PM/ton glass pulled) | Compliance Deadline |
|---|---|---|---|
| Waco Furnace A | Electrostatic Precipitator (ESP) | Filterable PM: 0.20 | May 1, 2014 |
| Waco Furnace B | ESP | Filterable PM: 0.20 | May 1, 2015 |
| Waco Furnace D | ESP | Filterable PM: 0.20 | June 1, 2013 |

No estimate of daily or annual emissions reductions in Texas was obvious in the consent decree or other reviewed EPA documentation. The Owens consent decree also required reductions from its Oklahoma facility that will help reduce $NO_X$, $SO_2$, and PM emissions in that state and reduce visibility impairing pollutants for the region.

## 2.4 FEDERAL MERCURY AND AIR TOXICS STANDARDS RULE

On February 16, 2012, the EPA published in the Federal Register the National Emission Standards for Hazardous Air Pollutants rule for coal and oil-fired electric utility steam generating units in 40 CFR Part 63, Subpart UUUUU, also referred to as the Mercury and Air Toxics Standards (MATS) rule (EPA 2012b). The MATS rule establishes Maximum Achievable Control Technology emission standards for hazardous air pollutants (HAP). For coal-fired EGUs, emission standards are established for mercury, acid gases, and non-mercury metal HAPs. The acid gas HAP emission standard for coal-fired EGUs is hydrogen chloride; however, units equipped with flue gas desulfurization (FGD) controls can choose to comply with an alternate $SO_2$ surrogate emission standard. For the non-mercury metal HAPs, coal-fired EGUs must meet one of three options, a surrogate filterable PM emissions standards, a total non-mercury metal HAP standard, or a suite of speciated non-mercury metal HAP standards. Existing EGUs have until April 16, 2015 to comply with the MATS rule; however, the TCEQ or the EPA can grant an additional one year for compliance if additional time is needed to install controls.

The TCEQ understands that most of the coal-fired EGUs in Texas are already meeting the filterable PM surrogate standard in the MATS rule. Therefore, any PM emission reductions from Texas coal-fired EGUs resulting from the MATS rule are expected to be minimal. Many of Texas' coal-fired EGUs already meet the hydrogen chloride standard or the alternate $SO_2$ standard, for those facilities equipped with FGD. However, some EGUs are anticipated to need additional acid gas controls to comply with the MATS rule. Even if these facilities install controls to reduce hydrogen chloride to meet the acid gas standard under MATS, such as dry sorbent injection, some ancillary reductions in $SO_2$ emissions would also occur. While the reductions cannot be quantified at this time, the TCEQ anticipates that some reductions in $SO_2$ emissions from Texas coal-fired EGUs will occur as a result of the MATS rule.

Throughout the United States, the EPA is predicting improved visibility due to the MATS rule since power plant emissions of $SO_2$ also can form fine particle pollution that reduces visibility (EPA 2012b). MATS emission reductions from surrounding states may help reduce visibility impairing pollutants impacting Texas' two Class I areas as well as Class I areas in states surrounding Texas.

## 2.5 FEDERAL PROGRAMS THAT REDUCE MOBILE SOURCE EMISSIONS

The Federal Motor Vehicle Control Program (FMVCP) has produced and is continuing to produce large reductions in motor vehicle emissions of $NO_X$, PM, and volatile organic

compounds (VOC). The increasingly lower federal limits on sulfur content for gasoline and diesel fuel are continuing to reduce the sulfur input to total sulfur emissions from internal combustion engines. Reduced sulfur limits are enabling lower $NO_X$, PM, and VOC emission limits for on-road motor vehicles, both diesel and gasoline, as well as for non-road engines. The lower sulfur fuel content is also enabling implementation of lower emission limits on new on-road and non-road engines. In March 2013, the EPA proposed a rule designed to reduce air pollution from passenger cars and trucks. If adopted, starting in 2017 Tier 3 would set new vehicle emissions standards and lower the sulfur content of gasoline.

The following lists several significant programs:

**Federal On-Road Measures**

- Federal Phase II reformulated gasoline Dallas-Fort Worth (DFW) and Houston-Galveston-Brazoria (HGB)
- Tier 2 vehicle emission standards and federal low-sulfur gasoline
- National low emissions vehicle standards
- Heavy-duty diesel standards

**Federal Non-Road Measures**

- Lawn and garden equipment
- Tier 2 heavy-duty diesel equipment
- Locomotive engine standards
- Compression ignition standards for vehicles and equipment
- Recreational marine engine standards

## 2.6 EMISSION REDUCTIONS FOR ELECTRIC GENERATING UNITS

Texas is not covered under the CAIR for the 1997 eight-hour ozone National Ambient Air Quality Standard (NAAQS), but is included for the 1997 particulate matter with diameter of 2.5 micrometers or less ($PM_{2.5}$) NAAQS. In addition to the annual $NO_X$ reductions from the CAIR program, in 1999 the state implemented a strategy in the eastern part of Texas to reduce $NO_X$ emissions from EGUs. The control strategies specific to EGUs include:

- electric utility generation in ozone nonattainment areas;
- electric utility generation in east and central Texas; and
- Texas-specific legislation from the 1999 76th session in Senate Bill (SB) 7 that requires $NO_X$ reductions through a regional cap and trade program.

These strategies have resulted in significant $NO_X$ emissions reductions from EGUs. These rules are summarized in Section 2.6.2: *Electric Utility Generation in Ozone Nonattainment Areas*, Section 2.6.3: *Electric Utility Generation in East and Central Texas*, and Section 2.6.4: *SB 7, 76th Texas Legislature* of this five-year progress report. (Chapter 4: *Emissions Inventory Development and Comparison* of this five-year progress report also contains additional details. Figure 4-2: *Actual and Projected Emissions Trends for Electric Power Generation* shows the $NO_X$ and $SO_2$ emissions reductions from EGUs from 2002 through 2011. Emissions of $NO_X$ have decreased 44% from 2002 through 2011. Sulfur dioxide emissions have decreased 23% during the same period.)

### 2.6.1 CAIR and Cross State Air Pollution Rule

In March 2005, the EPA issued CAIR to address EGU emissions that transport from one state to another (70 FR 25162). The rule incorporates the use of three cap and trade programs to reduce $SO_2$ and $NO_X$: the ozone-season $NO_X$ trading program; the annual $NO_X$ trading program; and the annual $SO_2$ trading program.

Texas was not included in the ozone season $NO_X$ program because Texas was not found to contribute to nonattainment or interfere with maintenance for ozone, but the state was included for the annual $NO_X$ and $SO_2$ programs for $PM_{2.5}$. As such, Texas must make necessary reductions in annual $SO_2$ and $NO_X$ emissions from new and existing EGUs. CAIR consists of two phases for implementing necessary $NO_X$ and $SO_2$ reductions. Phase I addresses required reductions from 2009 through 2014. Phase II addresses reductions in 2015 and thereafter. In July 2006, the TCEQ adopted a SIP revision to address how the state would meet the emissions allowance allocation budgets for $NO_X$ and $SO_2$ established by the EPA to meet the federal obligations under CAIR. The TCEQ adopted a second CAIR-related SIP revision in February 2010. This revision incorporated various federal rule revisions that the EPA had promulgated since the TCEQ's initial submittal. It also incorporated revisions to 30 TAC Chapter 101 resulting from legislation during the 80th Texas Legislature.

A December 2008 court decision found flaws in CAIR, but kept CAIR requirements in place temporarily while directing the EPA to issue a replacement rule. In July 2011, the EPA finalized Cross State Air Pollution Rule (CSAPR) to meet FCAA requirements and respond to the Court's order to issue a replacement program. Texas was included in CSAPR for ozone season $NO_X$, annual $NO_X$, and annual $SO_2$ due to the EPA's determination that Texas significantly contributes to nonattainment or interferes with maintenance of the 1997 eight-hour ozone NAAQS and the 1997 and 2006 $PM_{2.5}$ NAAQS in other states.

On August 21, 2012, the United States Court of Appeals for the District of Columbia Circuit vacated CSAPR. Under the court's ruling, CAIR will remain in place until the EPA develops a valid replacement. Therefore, all the requirements in CAIR are federally enforceable and all sources that are covered by CAIR must continue to comply with the requirements of the program.

Phase I of CAIR became effective in 2009 for $NO_X$ and in 2010 for $SO_2$. Phase II of CAIR will become effective in 2015. Table 2-6: *Annual Emissions Cap for EGUs under CAIR* shows the cap (total emission allowances for EGUs in Texas) decreasing under the CAIR program in tpy.

**Table 2-6: Annual Emissions Cap for EGUs under CAIR**

| Pollutant | 2003 Acid Rain Emissions Inventory (tpy) | CAIR Phase I Cap (tpy) | 2015 CAIR Phase II Cap (tpy) |
|---|---|---|---|
| **$NO_X$** | 211,000 | 181,014 (2009) | 150,845 |
| **$SO_2$** | 578,000 | 320,946 (2010) | 224,662 |

Source: EPA

Sources of $NO_X$ meeting certain applicability criteria and located in the DFW 1997 eight-hour ozone nonattainment area must meet emission specifications for attainment demonstration; the DFW counties include Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant. Sources of $NO_X$ meeting certain applicability criteria and located in the Beaumont-Port Arthur (BPA) 1997 eight-hour ozone maintenance area must meet emission specifications for

reasonably available control technology or emission specifications for attainment demonstration; the BPA counties include Hardin, Jefferson, and Orange Counties. Additionally, sources in the HGB 1997 eight-hour ozone nonattainment area satisfying applicability criteria must comply with the Mass Emissions Cap and Trade (MECT) program; the HGB counties include Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller.

When comparing the federal standards allowed in CAIR to the state $NO_X$ emission specifications listed in Chapter 117 for these ozone nonattainment and maintenance areas, CAIR $NO_X$ limitations are superseded by more stringent nonattainment $NO_X$ rules in Chapter 117, although all EGU emissions must fit under the CAIR cap and absorb a share of the CAIR cap. Additionally, the MECT program is more restrictive than CAIR (lower controlled allowable emission rate, ignoring trading) because MECT applies to almost all of the $NO_X$ sources at an EGU account, and MECT defines a lower $NO_X$ standard that must be met. Additional information is provided in Section 2.7.1: *HGB Area MECT Program*. For the attainment counties in the state, CAIR may be more restrictive and thus the limiting control.

### 2.6.2 Electric Utility Generation in Ozone Nonattainment Areas

The rules in 30 TAC Chapter 117, Subchapter C establish $NO_X$ emission specifications for electric utility generation for the BPA 1997 eight-hour ozone maintenance area; the HGB 1997 eight-hour ozone nonattainment area; and the DFW 1997 eight-hour ozone nonattainment area in Texas. These rules apply to each electric generating facility that generates electric energy for compensation, or are owned or operated by a municipality or Public Utility Commission (PUC) of Texas regulated utility or any of its successors, regardless of whether the successor is a municipality or is regulated by the PUC.

In the HGB 1997 eight-hour ozone nonattainment area, the owner or operator of each affected utility boiler, auxiliary steam boiler, or stationary gas turbine must demonstrate compliance with the $NO_X$ emission specifications through a system cap and participation in the HGB area MECT Program. Affected sources were required to comply with the MECT Program rules beginning January 1, 2002 and comply with the system cap requirements by March 31, 2004. Additional information about the MECT Program is available in Section 2.7.1.

In the DFW 1997 eight-hour ozone nonattainment area, each utility boiler that is part of a large system must meet a $NO_X$ emission rate of 0.033 pound per million British thermal units (lb/MMBtu) heat input, and each utility boiler that is part of a small system must meet a $NO_X$ emission rate of 0.06 lb/MMBtu heat input. Compliance with the $NO_X$ emission rates may be demonstrated on a daily average basis, a system-wide heat input weighted average basis for utility boilers that are part of a large system, or through the use of emission credits. Affected sources were required to comply with the rules by March 1, 2009.

In the BPA 1997 eight-hour ozone maintenance area, each utility boiler must meet a $NO_X$ emission rate of 0.10 lb/MMBtu heat input. Compliance with the $NO_X$ emission rates must be demonstrated on a daily average, through the use of a system cap, or through the use of emission credits. Affected sources were required to comply with the rules by May 1, 2005.

### 2.6.3 Electric Utility Generation in East and Central Texas

The rules in 30 TAC Chapter 117, Subchapter E, Division 1 limit $NO_X$ emissions from electric utility generation in Atascosa, Bastrop, Bexar, Brazos, Calhoun, Cherokee, Fannin, Fayette, Freestone, Goliad, Gregg, Grimes, Harrison, Henderson, Hood, Hunt, Lamar, Limestone, Marion, McLennan, Milam, Morris, Nueces, Parker, Red River, Robertson, Rusk, Titus, Travis, Victoria, and Wharton Counties. The rules apply to each electric utility power boiler and

stationary gas turbine (including duct burners used in turbine exhaust ducts) that generate electric energy for compensation; is owned by an electric cooperative, independent power producer, municipality, river authority, or public utility; and was placed into service before December 31, 1995. Electric utility power boilers must meet a $NO_X$ emission rate of 0.14 lb/MMBtu for gas-fired units and 0.165 lb/MMBtu for coal-fired units. Stationary gas turbines (including duct burners used in turbine exhaust ducts) must meet an annual average $NO_X$ emission rate of 0.14 lb/MMBtu for units subject to Texas Utilities Code (TUC), §39.264 [except §39.264(i)] or 0.15 lb/MMBtu for units not subject to TUC, §39.264 and units designated in accordance with TUC, §39.264(i). Compliance with the $NO_X$ emission rates is based on average heat input for a calendar year. Affected sources were required to comply with the rules by May 1, 2005.

### 2.6.4 SB 7, 76th Texas Legislature

SB 7, 76th Texas Legislature, requires a cap and trade program for previously grandfathered, or unpermitted, EGUs and other electric generating facilities that choose to participate in the cap and trade program. SB 7 requires a 50% reduction in $NO_X$ emissions and a 25% reduction in $SO_2$ emissions from the 1997 emission levels. The $NO_X$ allowances were determined using a $NO_X$ rate of 0.14 lb/MMBtu for grandfathered facilities in the East Texas region and a $NO_X$ rate of 0.195 lb/MMBtu for the grandfathered facilities in the West Texas and El Paso regions. The $SO_2$ allowances were determined using an $SO_2$ rate of 1.38 lb/MMBtu for grandfathered facilities in the East Texas region. There are no coal-fired electric generating facilities located in the West Texas and El Paso regions that are subject to the Emissions Banking and Trading Allowances Program. The SB 7 requirements were implemented through rules in 30 TAC Chapter 101, Subchapter H, Division 2 published in the *Texas Register* on January 7, 2000. The initial control period for this program began on May 1, 2003.

## 2.7 EMISSION REDUCTIONS FROM OTHER SOURCES

Texas has implemented numerous control measures to reduce ozone precursor emissions from a variety of sources. Reducing $NO_X$, a precursor of ozone and particulate matter, may have a co-benefit of reducing visibility-impairing pollutants. This section details some of the controls for major stationary sources and regional controls implemented as part of the state's strategy.

### 2.7.1 HGB Area MECT Program

The MECT Program rules in 30 TAC Chapter 101, Subchapter H, Division 3 established a mandatory annual $NO_X$ emission cap on all existing stationary sources in the HGB 1997 eight-hour ozone nonattainment area that emit at least 10 tpy of $NO_X$ and are subject to the $NO_X$ emission specifications in 30 TAC Chapter 117, Subchapter B, Division 3 and Subchapter C, Division 3. Affected units include: utility boilers, auxiliary steam boilers, or stationary gas turbines; industrial, commercial, or institutional boilers and process heaters; stationary gas turbines; stationary internal combustion engines; fluid catalytic cracking units (including carbon monoxide boilers, carbon monoxide furnaces, and catalyst regenerator vents); boilers and industrial furnaces that were regulated as existing facilities by the EPA under 40 CFR Part 266, Subpart H (as in effect on June 9, 1993); duct burners used in turbine exhaust ducts; pulping liquor recovery furnaces; lime kilns; lightweight aggregate kilns; heat treating furnaces and reheat furnaces; magnesium chloride fluidized bed dryers; and incinerators.

The MECT program cap is enforced by the allocation, trading, and banking of allowances. An allowance is the equivalent of one ton of $NO_X$ emissions. The MECT program cap was implemented on January 1, 2002, at historical emission levels, with mandatory $NO_X$ reductions increasing over time until achieving the final cap by April 1, 2007. All new or modified sources in

the HGB 1997 eight-hour ozone nonattainment area must obtain unused allowances from other sources already participating in the MECT program to offset any increased $NO_X$ emissions.

For sources in the HGB 1997 eight-hour ozone nonattainment area, MECT is more restrictive than CAIR (lower controlled allowable emission rate, ignoring trading), since MECT applies to almost all of the $NO_X$ sources at an EGU account, and MECT defines a lower $NO_X$ standard that must be met. Table 2-7: *Allocated $NO_X$ Allowances and Emissions under the MECT Program* and Figure 2-1: *Allocated $NO_X$ Allowances versus Emissions under MECT* show a comparison of allocated $NO_X$ allowances and actual $NO_X$ emissions for controls periods 2002 through 2011. As Figure 2-1 shows, MECT allocations and $NO_X$ emissions have decreased significantly.

**Table 2-7: Allocated $NO_X$ Allowances and Emissions under the MECT Program**

| MECT Control Period | Allocated $NO_X$ Allowances | $NO_X$ Emissions |
|---|---|---|
| 2002 | 231,104 | 107,629 |
| 2003 | 209,345 | 90,796 |
| 2004 | 139,372 | 74,337 |
| 2005 | 86,232 | 61,162 |
| 2006 | 63,631 | 51,914 |
| 2007 | 49,711 | 38,997 |
| 2008 | 44,859 | 32,622 |
| 2009 | 43,837 | 31,996 |
| 2010 | 43,549 | 30,475 |
| 2011 | 42,010 | 31,606 |

Source: www.tceq.texas.gov/airquality/banking/mass_ect_prog.html

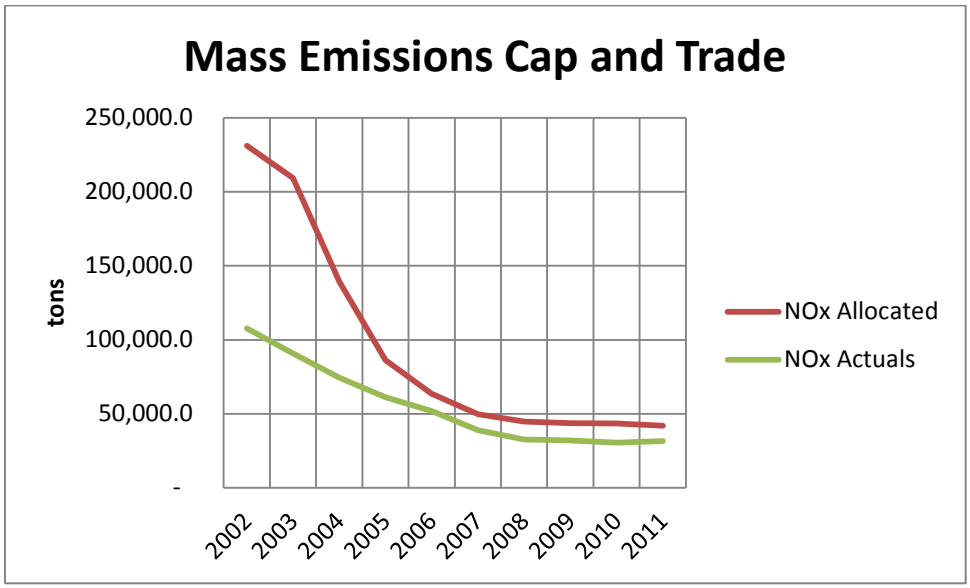



**Figure 2-1: Allocated $NO_X$ Allowances versus Emissions under MECT**

### 2.7.2 Cement Kilns

The rules in 30 TAC Chapter 117, Subchapter E, Division 1 limit $NO_X$ emissions from cement kilns in Bexar, Comal, Ellis, Hays, and McLennan Counties. Affected sources were required to comply with the rules by May 1, 2005. The cap limits $NO_X$ emissions from dry kilns to no more than 1.7 lb/ton of clinker and limits $NO_X$ emissions from wet kilns to no more than 3.4 lb/ton of clinker. Emissions from any kilns installed after 2005 must be offset with emission reductions at the site or through emission reduction credits. Affected sources were required to comply with the rules by March 1, 2009. When the rule was adopted, the TCEQ estimated that it would result in approximately 9.69 tons per day (tpd) of $NO_X$ emission reductions (see *Texas Register* June 8, 2007). The Ellis County cement kiln cap is part of the 2007 DFW Attainment Demonstration (AD) SIP Revision adopted May 23, 2007 (http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=117&sch=E&div=2&rl=Y).

### 2.7.3 East Texas Engines

The rules in 30 TAC Chapter 117, Subchapter E, Division 4 limit $NO_X$ emissions from certain engines located in Anderson, Brazos, Burleson, Camp, Cass, Cherokee, Franklin, Freestone, Gregg, Grimes, Harrison, Henderson, Hill, Hopkins, Hunt, Lee, Leon, Limestone, Madison, Marion, Morris, Nacogdoches, Navarro, Panola, Rains, Robertson, Rusk, Shelby, Smith, Titus, Upshur, Van Zandt, and Wood Counties (http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=117&sch=E&div=4&rl=Y). The rules apply to stationary, gas-fired, reciprocating internal combustion engines rated 240 horsepower (hp) and larger. Rich-burn gas-fired internal combustion engines rated less than 500 hp must limit $NO_X$ emissions to 1.0 gram per horsepower-hour (g/hp-hr). Rich-burn engines rated 500 hp or greater must limit $NO_X$ emissions to 0.60 g/hp-hr for landfill gas-fired engines or 0.50 g/hp-hr for all other rich-burn engines. Affected sources were required to comply with the rules by March 1, 2010.

Using photochemical modeling sensitivity studies, the TCEQ estimated that implementation of the rules results in an overall reduction of approximately 22.4 tpd of $NO_X$ emissions in the 33 counties subject to the rules by March 1, 2010. The TCEQ estimated the rules benefit the DFW 1997 eight-hour ozone nonattainment area by reducing ozone by an average of approximately 0.1 to 0.2 parts per billion. The DFW Eight-Hour Ozone AD SIP Revision adopted May 23, 2007 provides a discussion on this conclusion (see *Texas Register* June 8, 2007).

## 2.8 TEXAS VEHICLE INSPECTION AND MAINTENANCE PROGRAMS

Since 2005, the TCEQ has implemented programs that reduce Texas' regional haze impact at Class I areas in Texas and in surrounding states. Appendix C: *Mobile Source Control Programs Applicable to Texas* contains an updated list (March 2011) of federal on-road and non-road mobile sources and state rule revisions that regulate $NO_X$ and PM emissions into at least 2018. Motor vehicle inspection and maintenance programs are in place to maintain the effectiveness of the FMVCP in the HGB 1997 eight-hour ozone nonattainment area consisting of previously mentioned eight counties; the DFW 1997 eight-hour ozone nonattainment area consisting of previously mentioned nine counties; the Austin-Round Rock area consisting of Travis and Williamson Counties; and the El Paso area consisting of only El Paso County. The Texas Department of Public Safety administers the programs and the TCEQ maintains oversight of the programs, including collecting and analyzing data directly from the equipment at the inspection stations.

### 2.8.1 Air Check Texas Repair and Replacement Assistance Program

The TCEQ established a financial assistance program for qualified owners of vehicles that fail the emissions test. The purpose of this voluntary program is to remove older, more polluting vehicles from Texas eligible roadways in certain counties with high ozone (see map in Figure 2-2: *TERP Eligible Counties and Designated Highways and Roadways*). The Low Income Vehicle Repair Assistance, Retrofit, and Accelerated Vehicle Retirement Program (LIRAP) provisions of House Bill (HB) 2134, 77th Texas Legislature 2001, created the program. In 2005, the 79th Texas Legislature modified the program. The LIRAP applies only to counties that implement a vehicle inspection and maintenance program and have elected to implement LIRAP fee provisions. The counties included in LIRAP are Brazoria, Fort Bend, Galveston, Harris, Montgomery, Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, Travis, and Williamson.

SB 12, 80th Texas Legislature 2007, expanded LIRAP participation criteria by increasing the income eligibility to 300% of the federal poverty rate and increasing the amount of assistance toward the replacement of a retired vehicle. HB 3272, 82nd Texas Legislature 2011, Regular Session, expanded the class of vehicles eligible for a $3,500 voucher to include hybrid, electric, natural gas, and federal Tier 2, Bin 3 or cleaner vehicles. The program provides $3,500 for a replacement hybrid, electric, natural gas, and federal Tier 2, Bin 3 or cleaner vehicle of the current model year or the previous three model years; $3,000 for cars of the current or three model years; and $3,000 for trucks of the current or previous two model years. The retired vehicle must be 10-years old or older or have failed an emissions test. In Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties from December 12, 2007 through November 30, 2012, the program has retired and replaced 21,117 vehicles at a cost of $63,399,313. An additional 12,934 vehicles have had emissions-related repairs at a cost of $7,167,783.

The total repair and retirement/replacement expenditure for Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties from December 12, 2007 through November 30, 2012 is $210,609,922. HB 1, General Appropriations Bill, 82nd Texas Legislature 2011, Regular Session, continued program funding but at a reduced level. HB 1 appropriated $5.58 million for fiscal year (FY) 2012 and FY 2013 to continue this clean air strategy in the 16 participating counties. Brazoria, Fort Bend, Galveston, Harris, and Montgomery were allocated approximately $2.5 million for FY 2012 and FY 2013. Accelerated retirement of older, higher polluting vehicles will reduce $NO_X$, $PM_{2.5}$, and VOC emissions.

### 2.8.2 Texas Low Emissions Diesel Program

The goal of the Texas Low Emissions Diesel (TxLED) program is to lower emissions of $NO_X$ and other pollutants from diesel-powered motor vehicles and non-road equipment. Since diesel contains PM, reductions may co-benefit decreases of PM and therefore visibility impairing pollutants at Class I areas. It applies to diesel fuel producers, importers, common carriers, distributors, transporters, bulk terminal operators, and retailers. The rules cover 110 counties in eastern Texas, including the 1997 and 2008 eight-hour ozone nonattainment areas of DFW and HGB, and the 1997 eight-hour ozone maintenance area of BPA. The rules require that diesel fuel as defined under 30 TAC §114.6 produced for delivery and ultimate sale to the consumer for both on- and non-road use must contain less than 10% by volume of aromatic hydrocarbons and have a cetane number of 48 or greater. The rules, which took effect October 1, 2005, allow some compliance options (30 TAC Chapter 114, Subchapter A, §114.6 and Subchapter H, Division 2, §§114.312 - 114.319). The TCEQ has submitted these rules to the EPA as revisions to the Texas SIP. The EPA approved the TxLED rules on October 6, 2005 and revisions to the rules on October 24, 2008. The TCEQ revised the rules again in August 2012 and submitted the rule revisions to the EPA for approval.

## 2.9 THE TEXAS EMISSIONS REDUCTION PLAN

The Texas Emissions Reduction Plan (TERP) was established by the 77th Texas Legislature in 2001, through the enactment of SB 5. The legislation defines the program's objective to reduce $NO_X$ emissions from older heavy-duty, on-road vehicles and non-road equipment by providing grants and rebates for voluntary upgrades and replacements. $NO_X$ is a precursor to the formation of ground-level ozone, so the TERP program targets areas in Texas designated as nonattainment for ground-level ozone under the FCAA, as well as other ozone near nonattainment areas. The 42 current TERP-eligible counties are shown listed and on the map in Figure 2-2 on page 2-13. $NO_X$ is also a precursor of secondary particulate matter, which is a visibility-impairing pollutant. Therefore, reductions in $NO_X$ for ozone may also benefit regional haze. Reductions of diesel emissions also have the co-benefit of reducing PM, also reducing haze.

From FY 2002 through FY 2012, the TCEQ has issued over $858 million under the primary TERP emissions reduction grant program, representing a total of 8,884 projects, or 14,685 individual pieces of equipment and/or vehicles (see Appendix D: *TERP Report to the 83rd Legislature, 2011-2012*). From FY 2002 through FY 2012, this level of activity represents a projected reduction of 165,054 tons of $NO_X$, or the equivalent average daily reduction of 64.3 tons of $NO_X$ per day in 2012. Table 2-8: *Projects Funded from 2002 through 2012 by Emission Source* categorizes emission sources into five types and estimates approximately 23,500 tpy of reduced $NO_X$ in 2012. A project may take multiple years to complete so emission reductions are estimated until project completion.

**Table 2-8: Projects Funded from 2002 through 2012 by Emission Source**

| Emission Source | Number of Projects | Total $NO_X$ Reduced (tons) | Grant Amount (dollars) | Cost Per Ton (dollars) | Estimated $NO_X$ Reduced 2012 (tpd) |
|---|---|---|---|---|---|
| Non-Road | 4,710 | 37,978 | $273,791,779 | $7,209 | 19.3 |
| On-Road | 3,993 | 49,482 | $329,855,282 | $6,666 | 23 |
| Marine | 71 | 13,406 | $43,437,687 | $3,240 | 5.5 |
| Stationary | 68 | 4,247 | $13,639,988 | $3,212 | 1.7 |
| Locomotive | 42 | 59,941 | $198,211,648 | $3,307 | 14.8 |
| | **8,884** | **165,054** | **$858,936,385** | **$5,204** | **64.3** |

Source: adapted from www.tceq.texas.gov/assets/public/implementation/air/terp/FINAL_Summary_byES.pdf

TERP projects have typically included:

- purchases of new, low-emission equipment and vehicles;
- replacement of old, high-emission equipment and vehicles with more efficient, less-polluting models;
- retrofit and add-on devices designed to reduce $NO_X$ emissions from equipment and vehicles; and
- infrastructure to support qualifying fuels, electrification, and reduced idling time.

Since the creation of the TERP in 2001, there have been several key legislative enhancements, additions, and revisions.

In 2003, HB 1365, 78th Texas Legislature, established a new revenue source of vehicle title fee increases under Texas Transportation Code 501.138(a–b) to replace the original $225 out-of-

state vehicle registration fee. In addition, under Texas Tax Code 151.0515 the existing surcharge on the sale, lease, or rental of new or used off-road equipment increased from 1 to 2%. A 1% surcharge was added for the sale, lease, or use of model 1997 and later heavy-duty diesel on-road vehicles.

In 2005, HB 2481, 79th Texas Legislature, established cost-effectiveness limits for locomotive and marine vessel grants. The bill also directed the TCEQ to implement a new Rebate Grants program under the TERP incentive programs.

Also in 2005, HB 3469 authorized the TCEQ to create and implement a new Texas Clean School Bus Program to provide grants for technologies that reduce diesel-exhaust emissions inside the cabin of a school bus. Approved technologies include closed crankcase filtration systems, diesel particulate filters, and diesel oxidation catalysts. Over 6,800 Texas school buses have been retrofitted from FY 2008 through FY 2012.

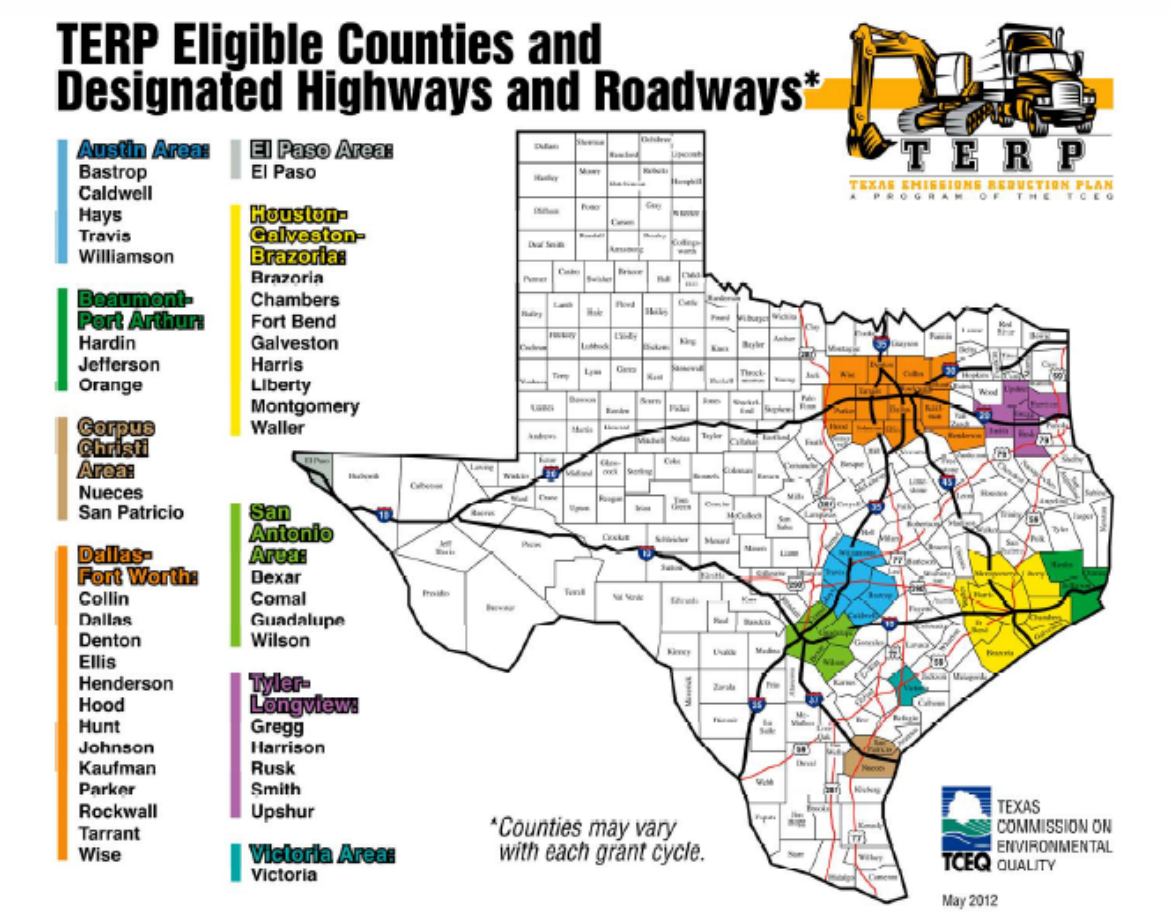



**Figure 2-2: TERP Eligible Counties and Designated Highways and Roadways**

In 2007, SB 12, 80th Texas Legislature, amended the TERP program. The bill raised the maximum cost-effectiveness of a grant project from $13,000 to $15,000 per ton of $NO_X$ reduced. In addition, SB 12 added marine vessels to the list of vehicles and equipment for which an electrification or idle-reduction infrastructure project may be funded. The bill authorized the TCEQ to fund other state agencies to lease, purchase, or install idle-reduction infrastructure at

rest areas and other public facilities located on major highway transportation routes in eligible nonattainment areas and affected counties.

Also in 2007, HB 160 added "rail relocation and improvement" as a new category to the list of infrastructure projects that may be funded under the TERP. The new project category was designed to fund rail relocation and improvement projects at major rail intersections in the eligible counties to reduce emissions from locomotive and vehicle engine idling.

In 2009, the 81st Texas Legislature modified some existing TERP programs and added new TERP programs through SB 1759 and HB 1796. SB 1759 established the Texas Clean Fleet Program to provide incentives for owners of large vehicle fleets in Texas to replace diesel vehicles with alternative fuel or hybrid vehicles. This program is authorized through August 2017. HB 1796 established the New Technology Implementation Grant Program to provide incentives for advanced clean energy projects, new technology projects, and electricity storage projects at facilities and stationary sources. In addition, the bill included a new definition of stationary engines under the TERP criteria to authorize grant funding for projects involving gas turbine engines. It also added "Location of use" provisions for projects involving non-road equipment used for natural gas recovery, and extended the TERP program authorization and fee sources through August 2019.

In 2011, the 82nd Texas Legislature modified existing TERP programs. HB 3399 modified some of the criteria applying to the TERP Emissions Reduction Incentive Grants Program, Small Business and Rebate Grants Programs, Third-Party Grants Program, and the Texas Clean Fleet Program. Changes and additions to the program eligibility criteria included: changes to the period over which a grant-funded vehicle must be operated to either five years or 400,000 miles, whichever occurs earlier; more specific criteria for decommissioning a vehicle or vehicle engine under the program; and provisions to allow a vehicle that has been leased or otherwise commercially financed to be replaced under the program.

SB 385 and SB 20 established the same new programs, with SB 385 serving as the controlling legislation since it was enacted last. The additional programs include the following:

- the Alternative Fueling Facilities Program (AFFP);
- the Clean Transportation Triangle (CTT) Program; and
- the Texas Natural Gas Vehicle Grant Program (TNGVGP).

The AFFP was established to fund fueling facilities for alternative fuels in the state's nonattainment areas. The CTT provides funding for fueling facilities specifically for compressed natural gas (CNG) and liquefied natural gas (LNG) within three miles of the interstate highways connecting the Houston, Dallas, Fort Worth, and San Antonio areas. The TNGVGP provides grant funding for replacing medium and heavy-duty on-road vehicles with vehicles fueled by CNG or LNG. Vehicles funded under the TNGVGP must be operated at least 75% of the annual miles in the state's nonattainment areas and along the interstate highways designated under the CTT Program. SB 527 revised the allocation percentages for use of the TERP Fund, eliminated the New Technology Research Development Program, and established a new program for monitoring air quality in the North Texas region.

The TERP revenue is allocated through appropriations from the state legislature. Table 2-9: *TERP Revenue* shows the TERP revenue for FY 2010 through FY 2012.

**Table 2-9: TERP Revenue**

| Agency | 2010 | 2011 | 2012 |
|---|---|---|---|
| **Total Funding** | $83,932,942 | $70,146,717 | $67,271,066 |

Source: TCEQ TERP Biennial Report (2011-2012)

### 2.9.1 New Technology Research and Development Program

The TCEQ received 44 New Technology Research and Development Program (NTRD) applications under its first application period in FY 2010 and awarded eight grants for approximately $6 million. Under its second NTRD application period in FY 2011, the TCEQ received 35 project applications and awarded six grants for approximately $6 million. Examples of the type of NTRD projects funded include:

- the testing and developing of hydrogen and electric tractors;
- a demonstration of a hydrogen bus and fueling system, in addition to demonstrations of electric-powered medium-duty delivery trucks; and
- the development and verification/certification testing for a selective catalytic reduction system for locomotives and marine engines.

### 2.9.2 New Technology Implementation Grants Program

The initial New Technology Implementation Grants Program (NTIG) application round opened in August 2010. The TCEQ reviewed three proposals for electricity storage projects and awarded two projects in FY 2011: a thermal storage system (in Floyd County) and an energy storage system for compressed air (in Gaines County), both capturing wind energy.

### 2.9.3 Texas Natural Gas Vehicle Grant Program

As of March 1, 2013, the program had selected 24 projects for funding under the Texas Natural Gas Vehicle Grant Program. These projects would replace 424 vehicles with new natural gas vehicles, for a total funding amount of $23,926,500.

### 2.9.4 Texas Clean Transportation Triangle Grant Program

The TCEQ received 21 CTT grant applications under its first application period in 2012, for a total of $3,725,000 of funds requested. Twelve of those projects, for $3,150,000, were selected for a grant and have executed contracts. An additional grant application period was held in FY 2013. As of April 2013, seven additional projects totaling $1,450,000 have been selected for funding.

### 2.9.5 Texas Alternative Fueling Facilities Grant Program

The TCEQ received 25 AFFP grant applications during its first application period in 2012 for a total of more than $11.7 million in funds requested. Application scoring and grant selection were completed the first quarter of FY 2013. Contracts for these grants will be finalized in FY 2013. The TCEQ anticipates awarding all available AFFP grant funds under this first solicitation.

### 2.9.6 Texas Clean School Bus Program

Over the 2012 through 2013 biennium, the legislature appropriated $2,239,602 for FY 2012 and $2,239,602 for FY 2013 for the Texas Clean School Bus Program to install retrofit devices to reduce diesel exhaust emissions from school buses throughout the state. The TCEQ has also supplemented state funding with federal funding, including $203,968 in State Clean Diesel funds awarded by the EPA in FY 2012. Reductions of diesel emissions have the co-benefit of reducing particulate matter, which is a visibility-impairing pollutant. As of November 19, 2012,

the TCEQ had reimbursed a total of $20,255,348, including $16,279,499 in state funds and $3,975,849 in federal funds from FY 2008 through FY 2012, to 181 school districts. During this time period, 6,812 school buses were retrofitted with 9,665 individual devices.

### 2.9.7 Emissions Reduction Incentive Grants Program

From FY 2002 through August 31, 2012, the TCEQ has awarded approximately 3,192 grants to the Emissions Reduction Incentive Grants (ERIG) Program for $639,017,826. The combined ERIG projects are currently estimated to reduce 137,269 tons of $NO_X$ emissions. Each project may include multiple activities for the replacement, repower, or retrofit of on-road vehicles, non-road equipment, locomotives, marine vessels, and stationary equipment. Some projects may also include infrastructure for alternative fuel or electricity, or to reduce idling of vehicles and equipment.

### 2.9.8 Rebate Grants Program

The ERIG program totals include funding for Rebate Grants. The Rebate Grants Program has been in place since April 2006. The TCEQ has awarded 2,172 rebate grants for a total of $142,234,466. The rebate grant projects are currently projected to reduce a total of 17,682 tons of $NO_X$ emissions.

### 2.9.9 American Recovery and Reinvestment Act Rebate Grants Program

The ERIG program totals include funding for grants using federal funds. The federal stimulus moneys for the TERP-American Recovery and Reinvestment Act Rebate Grants Program (ARRA) rebate grants included $12,632,318 awarded under a special round of rebate grants during 2010. A total of 234 ARRA rebate grants were awarded under this special federal stimulus program. The ARRA rebate grants are currently projected to reduce a total of 1,322 tons of $NO_X$ emissions.

### 2.9.10 Third-Party Grants Program

The ERIG totals include funding to third parties to provide pass-through subgrants for projects that meet the overall grant requirements. From 2004 through August 31, 2012, the TCEQ awarded third-party grants to the Railroad Commission of Texas, North Central Texas Council of Governments, Texas General Land Office, and Houston-Galveston Area Council, for a total of $64,260,608. The subgrants awarded by these entities are currently projected to reduce a total of 8,644 tons of $NO_X$ emissions, which are included under the totals for the ERIG program. Additional third-party grants to the Railroad Commission for $6 million and Houston-Galveston Area Council for $3 million were finalized in April 2013.

### 2.9.11 Texas Clean Fleet Program

The TCEQ received 13 applications under the first Texas Clean Fleet application period that closed in July 2010. Project selections were completed and eight grant awards issued in FY 2011. This initial round of Texas Clean Fleet grant awards totaled approximately $18 million. These grants are currently projected to reduce $NO_X$ emissions by a total of 166 tons.

### 2.9.12 Energy-Efficiency Grants Program

The Public Utility Commission (PUC) of Texas had jurisdiction for the Energy-Efficiency Grants Program established under Texas Health and Safety Code, Chapter 386, Subchapter E using money from the TERP Fund. However, the funding for that program was only provided from 2001 through 2002 before the legislature eliminated the funding in 2003. The PUC is also responsible for administering the energy efficiency incentive program for electric utilities under Texas Utilities Code, Section 39.905. The PUC is required to report the reductions of energy

demand, peak loads, and associated emissions achieved by the utilities through the incentive programs implemented by the utilities. The latest reporting year is 2011. The Transmission and Distribution Utilities (TDU), which are responsible for implementing the energy-efficiency program, exceeded their demand reduction goals by 191%, and saved nearly 529,334 megawatt-hours per year of energy. To implement energy-efficient measures, the TDU spent a total of $113,560,878 during year 2011.

Based on estimates from the Energy Systems Laboratory (ESL) at the Texas Engineering Experiment Station of the Texas A&M University system, the annual integrated savings from the PUC's energy-efficiency programs from approximately 2001 through the latest reporting year of 2011 were 2,861,805 megawatt-hours per year. Data for 2012 will be available in reports provided later in 2013.

### 2.9.13 Texas Building Energy Performance Standards

The ESL also assesses energy savings in nonattainment and affected counties for energy-compliant new construction. The ESL reports an estimated annual integrated electricity savings through 2011 for these programs of 2,073,290 megawatt-hours per year.

### 2.9.14 Energy-Efficiency Programs in Certain Political Subdivisions

The State Energy Conservation Office (SECO) within the Texas Comptroller of Public Accounts worked with state and local governmental entities to establish and implement goals to reduce electrical consumption by 5% per year, beginning January 2002. Additionally, the ESL assists these local governments and submits reports on the estimated energy savings and reductions in $NO_X$ emissions. During the first reporting cycles of SB 12, 80th Texas Legislature, 130 Texas jurisdictions reported adopting the 5% energy efficiency goal through 2013 for public facilities to reduce their electricity consumption. The ESL estimates that the annual integrated energy savings from energy efficiency commitment could be as high as 2,939,857 megawatt-hours per year. Organizations report their progress each year to the SECO and in turn, the SECO includes information for the TCEQ as part of its TERP reporting.

## 2.10 OTHER STATE ENERGY EFFICIENCY AND RENEWABLE ENERGY MEASURES

In 2005 (79th First Special Session), the Texas Legislature adopted Senate Bill 20 to expand Texas' target for renewable energy originally established in Senate Bill 7 in 1999 (76th Regular Session. Under Senate Bill 20, multiple milestones for installed renewable energy capacity were established through 2025 (Haberl, J. et al. 2012). The final target milestone in January 2025 was 10,000 megawatts (MW) of installed renewable capacity. Texas surpassed the 2025 target of 10,000 MW in 2010, primarily through wind generation. Additional information regarding Texas' progress with implementation of renewable energy may be found in annual reports (Statewide Air Emissions Calculations from Wind and Other Renewables) issued under contract with the TCEQ by the Energy Systems Laboratory, Texas A & M Engineering Experiment Station, The Texas A & M University System, at the following site: http://esl.tamu.edu/terp/reports.

In 2007 (80th Regular Session), Senate Bill 12 expanded the requirement in the Texas Health and Safety Code §388.005 for certain political subdivisions to set a goal of a reduction of 5% per year in electrical consumption to include institutions of higher education and state agencies. Senate Bill 898 in 2011 (82nd Regular Session) extended this requirement for an additional ten years beginning 2011.

## 2.11 $SO_2$ EMISSIONS REDUCTIONS RESULTING FROM SHUTDOWN

In 2011, the TCEQ sent an $SO_2$ special inventory request to owners and operators of $SO_2$ emission sources in Texas. The special inventory request resulted in information about which emission sources of $SO_2$ across the state owners and operators had retired and those that continued to operate and under what authorization. As part of continued progress toward reducing regional haze, the TCEQ considered those $SO_2$ emission sources that owners or operators had retired and the permanent reductions in $SO_2$ that accompanied the shutdown.

The shutdown of various units at different source categories in Texas has resulted in approximately 4,700 tpy of actual emission reductions in $SO_2$. Emission reductions are based on 2009 actual emissions reported to the TCEQ as part of a 2011 $SO_2$ special inventory request (see Appendix E: *Texas $SO_2$ Special Inventory*). The TCEQ considered data from 2009 through 2012 to coincide with this five-year report and the period after Texas submitted the 2009 regional haze SIP revision. No facilities reported expected shutdowns for 2013 in the $SO_2$ special inventory request, and the TCEQ excluded those scheduled for 2014 since those could not yet be confirmed in a permit or some other permanent, enforceable mechanism.

## 2.12 SUMMARY

The emissions TCEQ assessed were not all encompassing but focused on major visibility impairing sources like EGUs and other $SO_2$ source shutdowns, as $SO_2$ is one of the key pollutants impacting Texas' Class I areas. Details of the TERP program were expanded on in this SIP revision to emphasize the large investment that the state has made in the last five years and anticipates to continue dependent upon legislative appropriations. TERP has directly reduced mobile source $NO_X$ emissions, a precursor to PM, as well as mobile source direct PM emissions and therefore impacts potential visibility improvement. Some current multi-year TERP projects are scheduled to continue until 2015 while other programs are authorized by the Texas Legislature through 2019. Texas has demonstrated reductions that are adequate for sufficient progress towards the 2018 goals and anticipates continuing to reduce its visibility impairing pollutants.

# CHAPTER 3: ASSESSMENT OF VISIBILITY – 40 CFR §51.308(g)(3)

## 3.1 INTRODUCTION

40 Code of Federal Regulations (CFR) §51.308(g)(3) of the regional haze rule (the Rule) requires for each Class I area in the state, an assessment of 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:

- current visibility conditions for the most and least impaired days;
- difference between current visibility conditions for the most impaired and least impaired days and baseline visibility conditions; and
- change in visibility impairment for the most impaired and least impaired days over the past five years.

For this first five-year periodic report following submittal of the 2009 regional haze state implementation plan (SIP) revision, bullets two and three above are the same since the current five-year period analyzed (i.e., 2005 through 2009) is five years later than the baseline period, 2000 through 2004. Texas based this chapter on the analysis provided in the federal *Interagency Monitoring of Protected Visual Environments (IMPROVE) Report V* (2011), Appendix G: *Regional Haze Rule IMPROVE Progress Tracking Site Data Results by State* of (see Appendix F of this SIP revision).

The goal of the Rule is to restore natural visibility conditions by 2064 to the mandatory Class I federal areas. Section 51.301 defines natural conditions as “naturally occurring phenomena that reduce visibility as measured in terms of light extinction, visual range, contrast, or coloration.” The regional haze SIP must contain measures that make "reasonable progress" toward this goal by reducing anthropogenic emissions that cause haze. Chapter 6: *Assessment Of Reasonable Progress Goals* of this document will address Texas’ reasonable progress in detail. For each Class I area, there are three metrics of visibility that are part of the determination of reasonable progress:

- baseline conditions;
- natural conditions; and
- current conditions.

Each of the three metrics includes the concentration data of the visibility impairing pollutants as different terms in the light extinction equation, with respective extinction coefficients and relative humidity factors. The Rule stipulates use of the IMPROVE algorithm for calculating light extinction in Class I areas. The algorithm uses measured ambient concentrations of light scattering aerosols and humidity to estimate the light extinction. The 2011 IMPROVE report describes in detail how visibility impairment is calculated (IMPROVE 2011) Total light extinction when converted to deciviews is calculated for the average of the 20% least impaired and 20% most impaired visibility days.

The primary system used to measure air quality improvements for visibility purposes is the IMPROVE program, a cooperative effort between the United States Environmental Protection Agency (EPA), federal land management agencies, and state agencies. Air quality measurements in the IMPROVE network began in 1988; as of June 2011, there were 212 sites (170 current and 42 discontinued). In addition, the EPA’s Speciation Trends Network (STN) of 84 sites was originally included to expand the spatial and seasonal aerosol and reconstructed light extinction coefficient trends to include urban areas and to investigate the differences in urban and rural

aerosol concentrations. The STN was later transitioned into the Chemical Speciation Network (CSN) with 50 long-term trend sites and approximately 150 sites operated by state, local, and tribal agencies, primarily in urban/suburban settings.

For this SIP revision, the comparison of the average of the IMPROVE/CSN monitoring data for 2000 through 2004 is considered the baseline. The average of the IMPROVE/CSN monitoring data for 2005 through 2009 is considered current visibility conditions. Figure 3-1: *Absolute Change in Deciviews from the Baseline Years Through Current Period for the 20% Most Impaired Visibility Days* and Figure 3-2: *Absolute Change in Deciviews from the Baseline Years Through Current Period on the 20% Least Impaired Days* that follow are from the *IMPROVE Spatial and Seasonal Patterns and Temporal Variability of Haze and its Constituents in the United States Report V* (Hand et al. 2011) and indicate visibility improvement or degradation at monitoring sites across the United States.

Figure 3-1 shows 107 of the 110 IMPROVE regional haze monitoring sites. Brown circles indicate degradation in the 20% most impaired visibility days, while blue circles represent improvement in 20% most impaired visibility days.

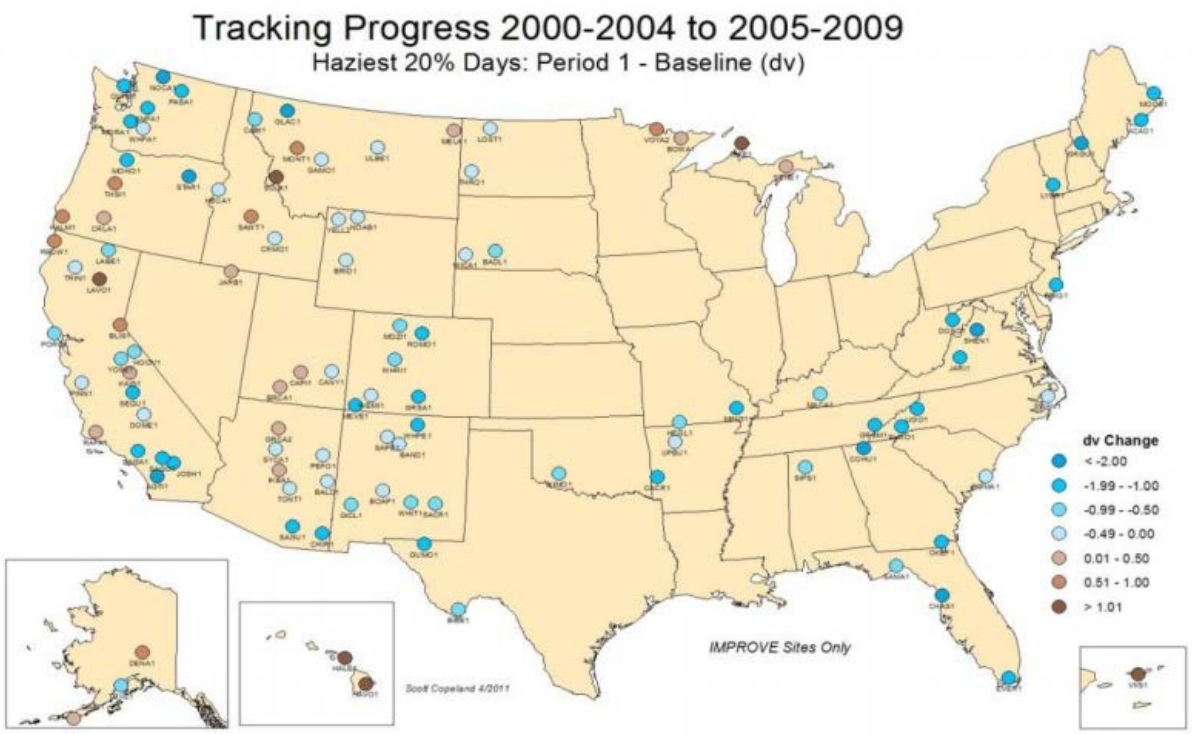



**Figure 3-1: Absolute Change in Deciviews from the Baseline Years Through Current Period for the 20% Most Impaired Visibility Days (deciview or dv)**

Figure 3-2 shows the 20% least impaired visibility days at 107 of the 110 IMPROVE regional haze monitoring sites. Brown circles indicate degradation the 20% least impaired visibility days, while blue circles represent improvement in the 20% least impaired visibility days.

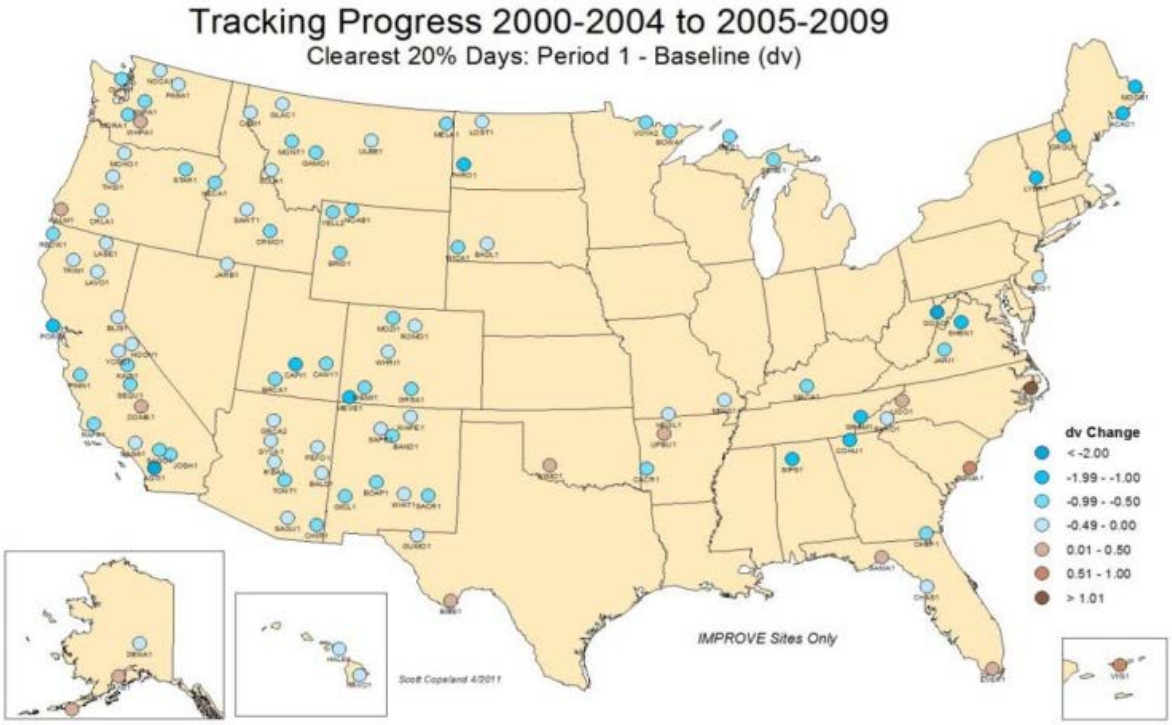



**Figure 3-2: Absolute Change in Deciviews from the Baseline Years Through Current Period on the 20% Least Impaired Days**

## 3.2 ASSESSMENT OF VISIBILITY CONDITIONS

"Visual range and extinction measurements are nonlinear with respect to human perception of visual scene changes caused by haze. The haziness index expressed in deciview units was developed such that a one deciview change would be a small but likely perceptible change in uniform haze conditions, regardless of the baseline visibility" (Pitchford and Malm 1994). When looking at the change in visibility extinction expressed in deciviews from an earlier period of time to a later one, an increase (i.e., positive change) in deciview number means there is degradation, a decrease (i.e., negative change) in deciview number means there is improvement.

Table 3-1: *Visibility at Texas Class I Areas on 20% Most Impaired Days* and Table 3-2: *Visibility at Texas Class I Areas on 20% Least Impaired Days* present the visibility conditions for the Texas Class I areas, Big Bend National Park and Guadalupe Mountains National Park. These data were obtained from 2011 IMPROVE report.

The tables show the baseline five-year average for years 2000 through 2004 in deciviews, the current five-year average for years 2005 through 2009, and the difference between the baseline and current averages. A negative value for the difference between baseline and current values indicates an improvement in visibility.

**Table 3-1: Visibility at Texas Class I Areas on 20% Most Impaired Days**

| Class I Area | Monitor | Baseline 5-Year Average 2000 through 2004 in deciviews (dv) | Current 5-Year Average 2005 through 2009 (dv) | Current Minus Baseline (dv) |
|---|---|---|---|---|
| Big Bend National Park | BIBE | 17.3 | 16.7 | -0.6 |
| Guadalupe Mountains National Park | GUMO | 17.2 | 15.9 | -1.3 |

**Table 3-2: Visibility at Texas Class I Areas on 20% Least Impaired Days**

| Class I Area | Monitor | Baseline 5-Year Average 2000 through 2004 (dv) | Current 5-Year Average 2005 through 2009 (dv) | Current Minus Baseline (dv) |
|---|---|---|---|---|
| Big Bend National Park | BIBE | 5.8 | 5.9 | 0.1 |
| Guadalupe Mountains National Park | GUMO | 5.9 | 5.4 | -0.5 |

Figure 3-3: *Annual Average Visibility at Big Bend National Park for the 20% Most Impaired Days* shows the annual average visibility conditions at Big Bend National Park for the 20% most impaired days there. Figure 3-4: *Annual Average Visibility at Big Bend National Park for the 20% Least Impaired Days* shows the annual average visibility conditions at Big Bend National Park for the 20% least impaired days. There is substantial year-to-year variation in each of these metrics. For this reason the five-year average is used to try to elucidate trends that may not be obvious in the year-to-year data. A slight positive difference between baseline and current value for the 20% least impaired days is found at Big Bend National Park. The TCEQ performed a T-test (Moore and McCabe, 1993) comparing the baseline to the current annual average visibility values for the 20% least impaired days at Big Bend National Park and found that there was no statistically significant difference in visibility impairment between the two time periods. Details of the test are presented in Appendix G: *Statistical Calculations*.

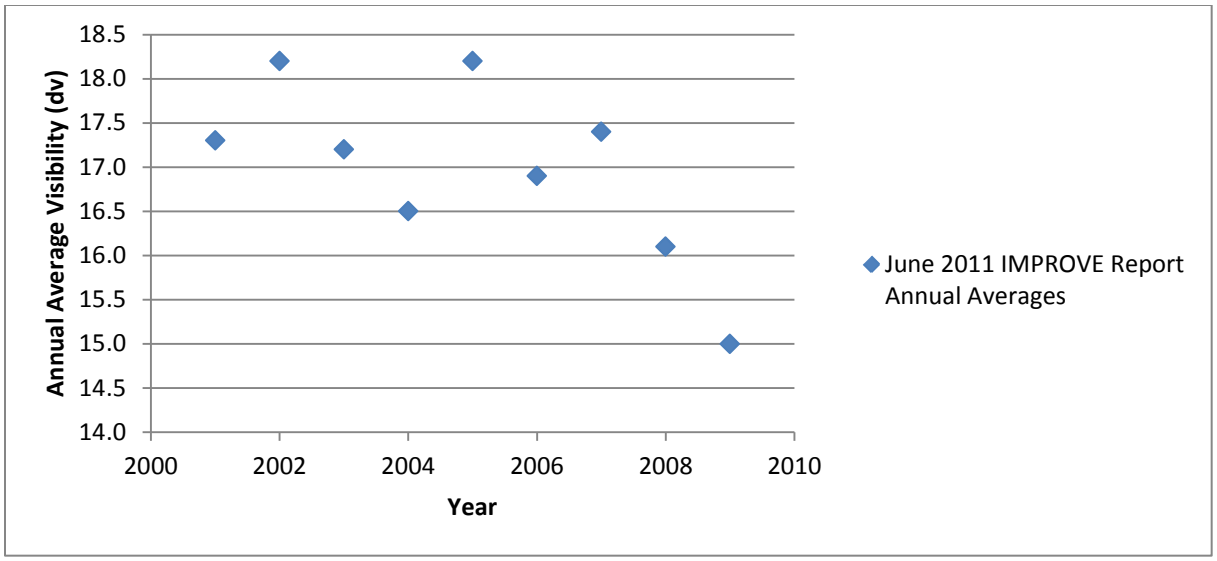



**Figure 3-3: Annual Average Visibility at Big Bend National Park for the 20% Most Impaired Days**

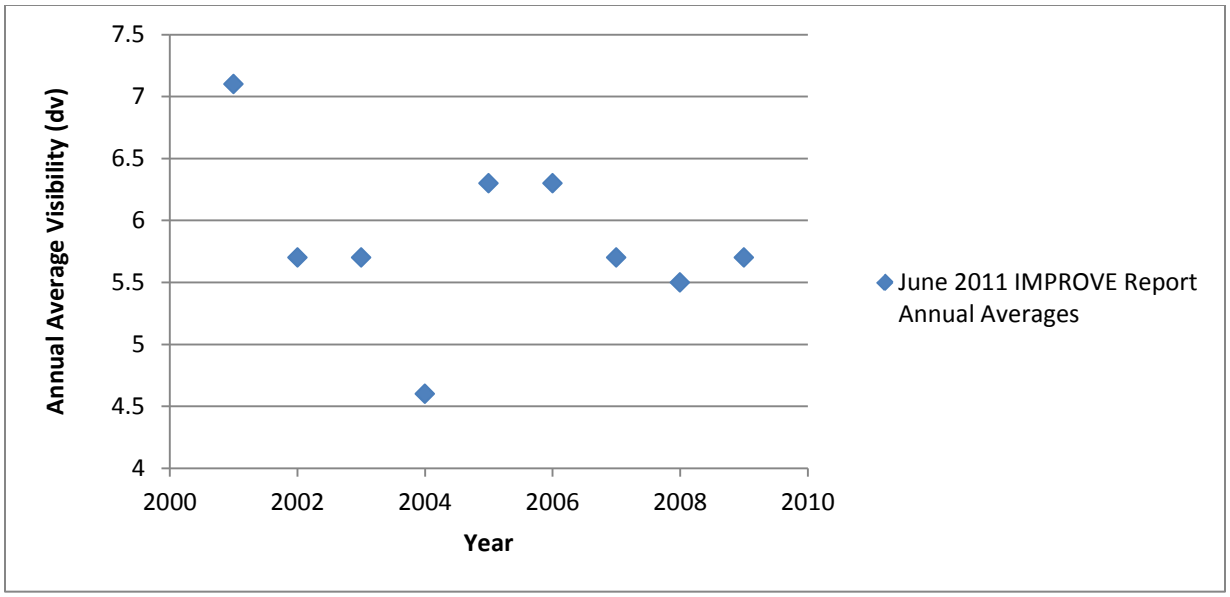



**Figure 3-4: Annual Average Visibility at Big Bend National Park for the 20% Least Impaired Days**

Texas will be consulting with its neighboring states after this SIP revision is proposed to discuss 12 of their Class I areas as the state did for the 2009 regional haze SIP. Table 3-3: *Visibility at Nearby Class I Areas on 20% Most Impaired Days* and Table 3-4: *Visibility at Nearby Class I Areas on 20% Least Impaired Days* presents the IMPROVE data for these nearby Class I areas. A slight positive difference between baseline and current value for the 20% least impaired days is found at Wichita Mountains Wilderness. The TCEQ performed a T-test comparing the baseline to the current annual average visibility values for the 20% least impaired days at Wichita Mountains Wilderness and found that there was no statistically significant difference in visibility impairment between the two time periods. Details of this test are presented in Appendix G.

**Table 3-3: Visibility at Nearby Class I Areas on 20% Most Impaired Days**

| Class I Area | Monitor | Baseline 5-Year Average 2000 through 2004 (dv) | Current 5-Year Average 2005 through 2009 (dv) | Current Minus Baseline (dv) |
|---|---|---|---|---|
| Caney Creek Wilderness Area, Arkansas | CACR | 26.4 | 25.3 | -1.1 |
| Upper Buffalo Wilderness Area, Arkansas | UPBU | 26.3 | 25.9 | -0.4 |
| Great Sand Dunes Wilderness Area, Colorado | GRSA | 12.8 | 11.4 | -1.4 |
| Breton Wilderness Area, Louisiana | BRET | 25.7 | pending | pending |
| Hercules-Glades Wilderness Area, Missouri | HEGL | 26.7 | 26.0 | -0.7 |
| Mingo Wilderness Area, Missouri | MING | 28.4 | 27.1 | -1.3 |
| Bosque del Apache Wilderness Area, New Mexico | BOAP | 13.8 | 13.4 | -0.4 |
| Carlsbad Caverns National Park, New Mexico | GUMO | 17.2 | 15.9 | -1.3 |
| Salt Creek Wilderness Area, New Mexico | SACR | 18.0 | 17.5 | -0.5 |
| Wheeler Peak Wilderness Area, New Mexico | WHPE | 10.4 | 9.1 | -1.3 |
| White Mountain Wilderness Area, New Mexico | WHIT | 13.7 | 13.2 | -0.5 |
| Wichita Mountains Wilderness, Oklahoma | WIMO | 23.8 | 23.0 | -0.8 |

**Table 3-4: Visibility at Nearby Class I Areas on 20% Least Impaired Days**

| Class I Area | Monitor | Baseline 5-Year Average 2000 through 2004 (dv) | Current 5-Year Average 2005 through 2009 (dv) | Current Minus Baseline (dv) |
|---|---|---|---|---|
| Caney Creek Wilderness Area, Arkansas | CACR | 11.2 | 10.7 | -0.5 |
| Upper Buffalo Wilderness Area, Arkansas | UPBU | 11.7 | 11.7 | 0 |
| Great Sand Dunes Wilderness Area, Colorado | GRSA | 4.5 | 3.6 | -0.9 |
| Breton Wilderness Area, Louisiana | BRET | 13.1 | pending | pending |
| Hercules-Glades Wilderness Area, Missouri | HEGL | 12.8 | 12.5 | -0.3 |
| Mingo Wilderness Area, Missouri | MING | 14.3 | 13.9 | -0.4 |
| Bosque del Apache Wilderness Area, New Mexico | BOAP | 6.3 | 5.8 | -0.5 |
| Carlsbad Caverns National Park, New Mexico | GUMO | 6.0 | 5.4 | -0.5 |
| Salt Creek Wilderness Area, New Mexico | SACR | 7.8 | 7.3 | -0.5 |
| Wheeler Peak Wilderness Area, New Mexico | WHPE | 1.2 | 0.9 | -0.3 |
| White Mountain Wilderness Area, New Mexico | WHIT | 3.6 | 3.3 | -0.1 |
| Wichita Mountains Wilderness, Oklahoma | WIMO | 9.8 | 9.9 | 0.1 |

## 3.3 SUMMARY

The reductions in visibility impairment for the 20% most impaired days at both Guadalupe Mountains and Big Bend National Parks and for the 20% least impaired days at Guadalupe Mountains National Park support the conclusion that the current strategy is adequate to meet the established reasonable progress goals at both Class I areas in Texas. In light of the wide year-to-year variation in average visibility impairment on the 20% least visibility impaired days at Big Bend National Park, the statistically insignificant increase in visibility impairment from

2000 through 2004 to the 2005 through 2009 period may be an anomaly resulting from year-to-year variation or it may be the result of undocumented changes in international transport of anthropogenic emissions impacts on visibility. Another possibility is that year-to-year variation in dust storms resulting from natural variation in meteorology and transport of dust from dry lake beds in Mexico could have produced the slight increase in visibility impairment on the least impaired 20% of days at Big Bend National Park.

# CHAPTER 4: EMISSIONS INVENTORY DEVELOPMENT AND COMPARISON – 40 CFR §51.308(g) (4) and (5)

The regional haze rule (the Rule) 40 Code of Federal Regulations (CFR) §51.308(g)(4) requires an analysis tracking the change for the past five 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.

40 CFR §51.308(g)(5) requires an assessment of any significant changes in anthropogenic emissions within the state that have occurred over the past five years that have limited or impeded progress in reducing pollutant emissions and improving visibility.

## 4.1 BACKGROUND

The 1990 Federal Clean Air Act Amendments require that emissions inventories (EI) be prepared statewide for point, nonpoint (area), on-road, and non-road mobile emissions categories statewide. The Texas Commission on Environmental Quality (TCEQ) maintains an EI of up-to-date information on emissions of sulfur dioxide ($SO_2$), volatile organic compounds (VOC), carbon monoxide (CO), nitrogen oxides ($NO_X$), lead and lead compounds, ammonia ($NH_3$) particulate matter less than 2.5 micrometers ($PM_{2.5}$), and particulate matter less than 10 micrometers ($PM_{10}$). The EI identifies the types of emissions sources present in an area, the amount of each pollutant emitted, and the types of process and control devices employed at each plant or source category. The EI provides data for a variety of air quality planning tasks, including establishing baseline emission levels, calculating emission reduction targets, control strategy development for reducing emissions, emission inputs into air quality simulation models, and tracking actual emissions. These EIs are critical for the efforts of state, local, and federal agencies to demonstrate attainment of the National Ambient Air Quality Standards.

This chapter discusses general EI development for each of the anthropogenic source categories and compares actual emissions trends with modeled projections for the state and electric generating utilities.

## 4.2 INDUSTRIAL POINT SOURCES

Stationary point source emissions data are collected annually from sites that meet the reporting requirements of 30 Texas Administrative Code (TAC) §101.10. These sites include, but are not limited to, refineries, chemical plants, bulk terminals, and utilities. To collect the data, the TCEQ sent EI questionnaires (EIQ) to all sites identified as meeting the reporting requirements. Companies were required to report emissions data and to provide sample calculations used to determine the emissions. Information characterizing the process equipment, the abatement units, and the emission points was also required. All data submitted in the EIQ were reviewed for quality assurance purposes and then stored in the State of Texas Air Reporting System database. At the end of the annual reporting cycle, point source emissions data are reported each year to the United States Environmental Protection Agency (EPA) for inclusion in the National Emissions Inventory (NEI).

## 4.3 AREA SOURCE

Stationary sources that do not meet the reporting requirements for point sources are classified as area sources. Area sources are small-scale industrial, commercial, and residential sources that use materials or perform processes that generate emissions. Area sources can be characterized by the mechanism in which emissions are released into the atmosphere: evaporative or combustion. Evaporative emission sources include the following: oil and gas production facilities, printing processes, industrial coating and degreasing operations, gasoline service

station underground tank filling, and vehicle refueling operations. Combustion sources include the following small facilities with less than 100 tons per year of emissions: oil and gas production facilities, stationary source fossil fuel combustion at residences and businesses, outdoor burning, structural fires, and wildfires.

Emissions are calculated as county-wide totals rather than as individual facilities. The emissions from area sources may be calculated by applying an EPA-established emission factor (emissions per unit of activity) to the appropriate activity or activity surrogate responsible for generating emissions. Examples of activity or activity surrogate data include the following: population, crude oil and gas production, the amount of gasoline sold in an area, employment by industry type, and acres of crop land. The activity data are obtained via surveys, research, and/or investigations. The air emissions data from the different area source categories are collected, reviewed for quality assurance, stored in the Texas Air Emissions Repository database system, and compiled to develop the statewide area source EI. This area source periodic emissions inventory (PEI) is reported every third year (triennially) to the EPA for inclusion in the NEI.

## 4.4 ON-ROAD MOBILE

On-road mobile sources consist of passenger cars, passenger trucks, motorcycles, buses, heavy-duty trucks, and other motor vehicles traveling on public roadways. Combustion-related emissions are estimated for vehicle engine exhaust, and evaporative hydrocarbon emissions are estimated for the fuel tank and other non-tailpipe sources from the vehicle. To calculate pollution from on-road mobile sources, emission rates are estimated as a function of county, vehicle type, roadway type, hour, and operating speed. These rates are then matched with appropriate activity from transportation data sources such as vehicle miles traveled (VMT), number of vehicles parked, hours spent in extended idle mode, etc.

Emission factors were developed using the latest version of the EPA's on-road model, which is the Motor Vehicle Emissions Simulator 2010a (MOVES2010a). Various inputs are provided to MOVES2010a to simulate the vehicle fleet in each nonattainment area such as vehicle speeds, vehicle age distributions, local meteorological conditions, type of Inspection and Maintenance Program, and local fuel properties. Separate gasoline and diesel fuel emission factors are developed for the thirteen MOVES2010a vehicle types.

For major metropolitan areas, a significant source of vehicle activity is typically the local travel demand model, which is run by the Texas Transportation Institute, the Texas Department of Transportation, or the regional metropolitan planning organization.

## 4.5 NON-ROAD MOBILE

Non-road mobile sources include vehicles, engines, and equipment used for construction, agriculture, transportation, recreation, and many other purposes. Non-road vehicles are also referred to as off-road or off-highway vehicles that do not normally operate on roads or highways. This broad category is composed of a diverse collection of machines, many of which are powered by diesel engines. Examples of non-road mobile sources include, but are not limited to: agricultural equipment, commercial and industrial equipment, construction and mining equipment, lawn and garden equipment, aircraft, locomotives, and commercial marine vessels.

A Texas specific version of the EPA NONROAD 2008a model, called the Texas NONROAD (TexN) model, was used to calculate emissions from all non-road mobile equipment and recreational vehicles except aircraft, ground support equipment, and locomotives. While the TexN model utilizes input files and post-processing routines to estimate Texas specific emissions estimates, it retains the EPA NONROAD 2008a model to conduct the basic emissions

estimation calculations. Several input files provide necessary information to calculate and allocate emission estimates. The inputs used in the TexN model include emission factors, base year equipment population, activity, load factor, meteorological data, average lifetime, scrappage function, growth estimates, emission standard phase-in schedule, and geographic and temporal allocation.

Emissions for the source categories that are not in the EPA NONROAD 2008a model are estimated using other EPA-approved methods and guidance documents. Airport emissions are calculated using the Federal Aviation Administration's Emissions and Dispersion Modeling System, version 5.1. Locomotive emission estimates for Texas are based on specific fuel usage data derived from railway segment level gross ton mileage activity (line-haul locomotives) and hours of operation (yard locomotives) provided directly by the Class I railroad companies operating in Texas.

## 4.6 EMISSIONS DATA

Emissions data for 2005, 2008, and 2011 are listed below in Table 4-1: *Updated Texas Emissions Inventory Summary for 2005*, Table 4-2: *Texas Emissions Inventory Summary for 2008*, and Table 4-3: *Texas Emissions Inventory Summary for 2011*. Although outside the five-year analysis period, 2011 data represents the most current emissions data. The 2005 data were reported in Appendix 7-1: *Texas Emissions Inventory Development: Base Year 2002 and Projected Year 2018* of the 2009 regional haze state implementation plan (SIP) revision in Table 7-4: *Texas Emissions Inventory Summary for 2005.* There are corrections and updates to that table listed below in Table 4-1. The $NO_X$ amount reported in the 2009 regional haze SIP revision was truncated in error. Corrections to $PM_{10}$ emissions were also corrected and listed in Table 4-1 for the area source category. Because unpaved road fugitives were not estimated in 2005, the reported 2008 unpaved road fugitive emission values were backcast to estimate the 2005 values. The backcasting resulted in an increase of 1,445,135 tons per year (tpy) for $PM_{10}$ and 143,912 tpy for $PM_{2.5}$.

**Table 4-1: Updated Texas Emissions Inventory Summary for 2005**

| Category | $SO_2$ (tpy) | $NO_X$ (tpy) | CO (tpy) | VOC (tpy) | $NH_3$ (tpy) | $PM_{10}$ (tpy) | $PM_{2.5}$ (tpy) |
|---|---|---|---|---|---|---|---|
| **Point** | 758,168 | 453,665 | 485,037 | 144,378 | 3,466 | 65,433 | 34,701 |
| **Area** | 17,924 | 250,336 | 895,966 | 746,900 | 412,764 | 2,484,513 | 350,609 |
| **On-road Mobile** | 12,307 | 651,415 | 3,148,686 | 233,243 | 24,935 | 15,611 | 10,874 |
| **Non-road Mobile** | 2,268 | 135,341 | 1,106,191 | 123,756 | 3,518 | 13,433 | 12,906 |
| **Total** | 790,667 | 1,490,757 | 5,635,880 | 1,248,277 | 444,683 | 2,578,990 | 409,090 |

Data are current as of 2/27/2013.

**Table 4-2: Texas Emissions Inventory Summary for 2008**

| Category | $SO_2$ (tpy) | $NO_X$ (tpy) | CO (tpy) | VOC (tpy) | $NH_3$ (tpy) | $PM_{10}$ (tpy) | $PM_{2.5}$ (tpy) |
|---|---|---|---|---|---|---|---|
| **Point** | 601,768 | 372,464 | 402,224 | 117,737 | 3,106 | 64,008 | 35,043 |
| **Area** | 12,047 | 281,390 | 731,727 | 1,783,937 | 312,885 | 2,310,297 | 325,488 |
| **On-road Mobile** | 2,975 | 438,006 | 2,682,762 | 193,040 | 25,816 | 12,120 | 7,532 |
| **Non-road Mobile** | 31,756 | 275,724 | 1,086,157 | 130,916 | 6,522 | 21,674 | 20,336 |
| **Total** | 648,546 | 1,367,584 | 4,902,870 | 2,225,630 | 348,329 | 2,408,099 | 388,399 |

Data are current as of 11/9/2012.

**Table 4-3: Texas Emissions Inventory Summary for 2011**

| Category | $SO_2$ (tpy) | $NO_X$ (tpy) | CO (tpy) | VOC (tpy) | $NH_3$ (tpy) | $PM_{10}$ (tpy) | $PM_{2.5}$ (tpy) |
|---|---|---|---|---|---|---|---|
| Point | 512,261 | 323,056 | 310,954 | 101,942 | 3,467 | 57,710 | 33,667 |
| Area | 8,749 | 225,984 | 300,126 | 1,374,269 | 309,124 | 2,266,223 | 312,371 |
| On-road Mobile | 1,987 | 468,480 | 1,820,081 | 148,386 | 8,667 | 21,547 | 16,722 |
| Non-road Mobile | 6,667 | 261,130 | 874,247 | 109,319 | 769 | 17,794 | 16,995 |
| Total | 529,664 | 1,278,650 | 3,305,408 | 1,733,916 | 322,027 | 2,363,274 | 379,755 |

Data are current as of 2/27/2013.

## 4.7 STATEWIDE EMISSIONS DATA COMPARISON

For the 2009 regional haze SIP revision, actual 2002 inventory data was forecast to 2018. These emissions data and the approach used to develop the projections are summarized in 2009 regional haze SIP revision; the EI data were in Chapter 7: *Emissions Inventory* and modeling was summarized in Chapter 8: *Modeling Assessment*. The regional haze inventory used modeling inventory data including total organic gas (TOG) rather than VOC. TOG includes total hydrocarbons and should not be compared with the VOC in the 2005, 2008, and 2011 inventories listed in Tables 4-1, 4-2, and 4-3.

Central Regional Air Planning Association (CENRAP) sponsored regional haze SIP modeling predicted that emissions of $NH_3$, TOG, and particulates (both $PM_{10}$ and $PM_{2.5}$) would increase between 2002 the projected 2018 inventory. Decreases in statewide emissions were also predicted between 2005 and 2018 for $NO_X$, $SO_2$, and CO. These predicted trends are generally supported between reported 2005 and 2011 inventory data except for the decreases in $NH_3$.

Changes were seen in the on-road mobile source inventory between 2008 and 2011 as result of the transition from the EPA's MOBLE6 to MOVES model for estimating emissions. Increases in on-road mobile source $PM_{10}$ and $PM_{2.5}$ emissions have been documented (EPA 2009) as part of the new model's estimation methodology. In spite of this increase, reductions in the other categories resulted in state-wide reductions in estimated $PM_{10}$ and $PM_{2.5}$.

Ammonia emissions estimates decreased significantly between 2008 and 2011 in the on-road and non-road mobile source categories as a result of the transition from MOBILE6 to MOVES. Catalytic $NO_X$ reduction implemented on vehicles beginning in the early 1980s led to increases

in ammonia emission rates up until phase in of NLEV and Tier 2 emission standards. As emissions standards continued to drop and vehicle emission control technology continued to improve, ammonia emissions fell to nearly the levels observed prior to the introduction of the three-way catalyst. Since the National Low Emissions vehicle (NLEV) program started in 2001 and Tier 2 started in 2004, the effects of these two programs were greater in 2011 than 2008. Additionally, as the early 1980s vehicles aged, $NO_X$ emissions rose with catalyst deterioration, and ammonia levels dropped proportionately. This aging effect was modeled in MOVES more accurately based on more current information.

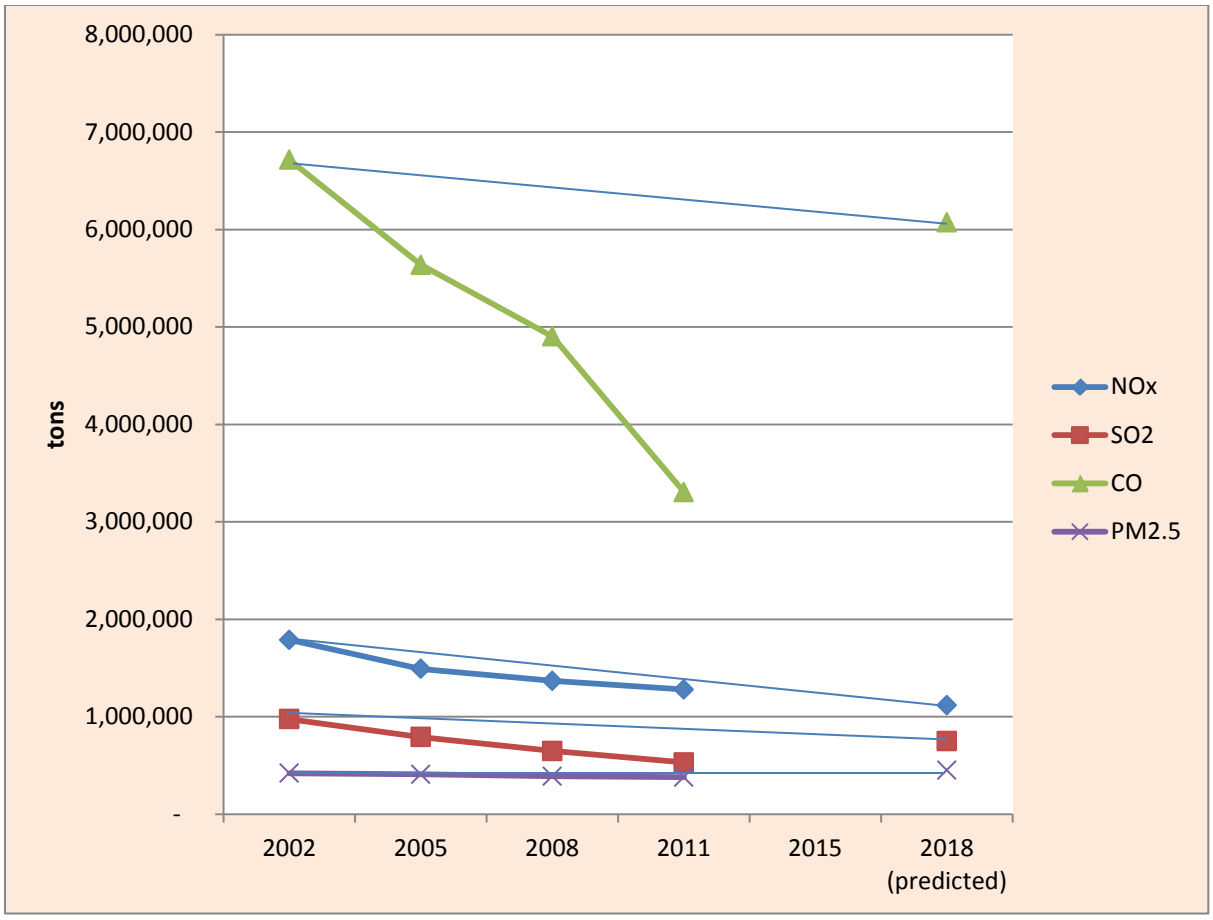
Non-road emissions increased between 2002 and 2005 for several reasons. The inventory was improved with more precise data and accurate emissions factors. Additionally, a different model was used for the 2008 inventory; the NONROAD2005 model was used for 2005 inventory and NONROAD2008a was used for the 2008 EI development. Input data was improved for the more recent inventory. Several survey studies were conducted to improve model input data (including activity, population, engine horsepower information) for the 2008 EI. There were also updated models and improved EI methodologies for airport, locomotive, commercial marine vessels, and drilling diesel engines.

The 2008 area source inventory was enhanced with additional categories as part of the commission's initiative to improve inventory estimations. In 2005, limited categories were used for the oil and gas inventory. The 2008 inventory was expanded with emissions estimates from additional oil and gas categories and improved fertilizer and livestock categories. These improvements combined with an increase in oil and gas activity increased the 2008 VOC emissions estimates. The improved agricultural estimates resulted in a decrease in the ammonia estimates.

Significant reductions in CO emissions were listed in the 2011 area source inventory because wildfires were not included. Wildfires comprised 414,736 tpy of CO in 2008. For the 2011 EI, Texas will use the EPA default values that will be published in the NEI General Public Release version 1.0 that will be available in July 2013. Additionally, updated methodology was used for combustion calculations, resulting in some changes in the emissions estimates.

The $SO_2$ emissions decreased between 2005 and 2011 because of phasing in low sulfur [500 parts per million (ppm)] and ultra-low sulfur (15 ppm) fuels for non-road, locomotive, and marine engines beginning in 2007. These lower fuel requirements, coupled with advanced emission control technologies, are expected to decrease emissions from these engines by more than 90% between 2007 and 2014.

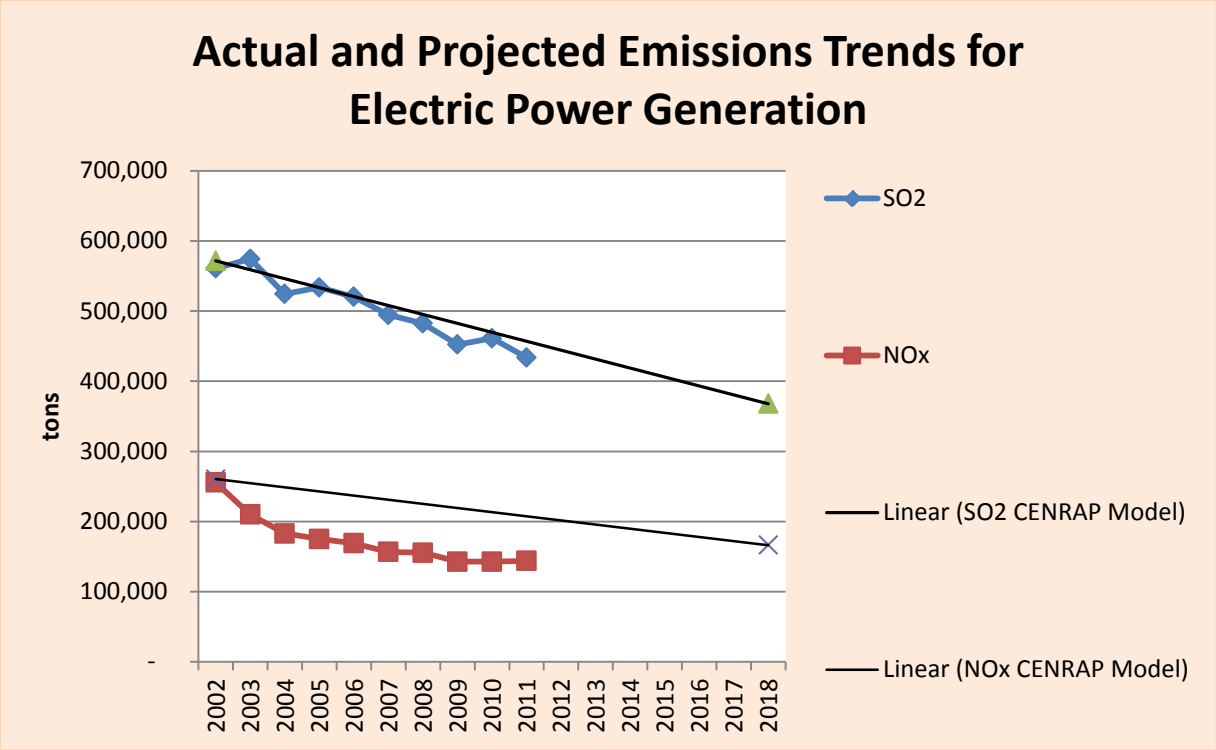
Statewide trends for $NO_X$, $SO_2$, CO, and $PM_{2.5}$ as compared with the modeling projections for 2018 are shown in Figure 4-1: *Actual and Projected Statewide Emissions Trends for Select Pollutants*. Actual emissions have remained below the projected modeling projections (shown as a straight line between 2002 and 2018) for all pollutants. VOC emissions are not included because a trend analysis with the projected amount was not possible for this pollutant; 2002 and the projected 2018 are represented as TOG and actual data are VOC emissions. Total industrial point source, area, on-road mobile, and non-road mobile state-wide emissions are compared with the projected trends from the CENRAP modeling.




Data are current as of 2/27/2013.

**Figure 4-1: Actual and Projected Statewide Emissions Trends for Select Pollutants**

Figure 4-2: *Actual and Projected Emissions Trends for Electric Power Generation* shows the downward trends for $NO_X$ and $SO_2$ for all electric generating units (EGU) in Texas. Values are for all point sources with a standard industrial classification of 4911 (Electric Services). The actual emissions for the periodic years from 2002 through 2011 are compared against a linear change between 2002 actual emissions and 2018 modeled emissions. Actual emissions remain below predicted values for $NO_X$, $SO_2$, CO, and $PM_{2.5}$. The category includes all the EGUs that were considered potentially Best Available Retrofit Technology (BART)-eligible. $SO_2$ is the most significant visibility-impairing pollutant emitted in Texas and EGUs are most significant $SO_2$ emitters in Texas.




Data are current as of 1/30/2013.

**Figure 4-2: Actual and Projected Emissions Trends for Electric Power Generation**

Emissions of $NO_X$ decreased 44% from 255,556 tons in 2002 to 143,782 tons in 2011. Sulfur dioxide emissions decreased 23% from 560,860 tpy to 433,782 tpy during the same period. Emissions have trended downward better than or as predicted in the CENRAP modeling projections. It is noted that an earlier, more rapid decrease in $NO_X$ emissions occurred and the 2011 level of 143,782 tpy is below the projected value for 2018 of 166,253 tpy.

## 4.8 SUMMARY

As required in 40 CFR 51.308(g)(4), Texas analyzed changes in emissions of pollutants contributing to visibility impairment from sources within the state and determined the major visibility impairing pollutants – $SO_2$, $NO_X$, $PM_{10}$, and $PM_{2.5}$ – are decreasing. Electric power industry emissions, a major source of $SO_2$ in Texas, was analyzed and showed a continued downward trend from 533,650 tpy in 2005 to 433,782 tpy in 2011, a decrease of approximately 99,870 tpy in seven years.

To address 40 CFR 51.308(g)(5), Texas is explicitly indicating there are no significant changes in the anthropogenic emissions of concern that have limited or impeded progress in reducing pollutant emissions and improving visibility.

# CHAPTER 5: ASSESSMENT OF REASONABLE PROGRESS GOALS – 40 CFR §51.308(g)(6)

## 5.1 INTRODUCTION

40 Code of Federal Regulations (CFR) §51.308(g)(6) of the regional haze rule (the Rule) requires an assessment of whether the current implementation plan elements and strategies are sufficient to enable the state, or other states with Class I areas affected by emissions from that state, to meet all established reasonable progress goals.

The Texas Commission on Environmental Quality (TCEQ) has assessed the current state implementation plan (SIP) elements and strategies and determined that they are sufficient to enable Texas and other states with Class I areas affected by emissions from Texas to meet all established reasonable progress goals.

The revisions to the SIP concerning regional haze adopted by the commission on February 25, 2009 requested that the United States Environmental Protection Agency (EPA) initiate and pursue federal efforts to reduce international transport of visibility impairing pollutants into Texas. The TCEQ reaffirms that request. As discussed in the 2009 SIP submittal Chapter 11: *Long-term Strategy to Reach Reasonable Progress Goals*, modeling attributed more than half of the visibility impairment at Big Bend National Park on the 20% most impaired days to pollution originating outside the United States. As the 2009 SIP submittal noted, it will not be possible for the two Class I areas in Texas to approach natural conditions without large reductions in the visibility reducing pollution impacting them from sources outside the United States.

## 5.2 CONTROL MEASURES IN THE 2009 REGIONAL HAZE SIP REVISION

The control measures contained in the Texas 2009 regional haze SIP revision all remain in force and are being implemented. The significant increases in solid fossil fueled electric generating units (EGU) that was predicted by Integrated Planning Model runs has not occurred. A new measure that may significantly constrain or prevent the construction of new Texas solid fossil fueled EGUs is the EPA's 2010 sulfur dioxide ($SO_2$) one-hour National Ambient Air Quality Standard (NAAQS). The addition of this measure may further strengthen the package of control measures enumerated in Texas' 2009 regional haze SIP revision.

## 5.3 VISIBILITY IMPROVEMENTS AT CLASS I AREAS IMPACTED BY TEXAS

Figure 5-1: *Visibility Improvement at Big Bend National Park for 20% Most Impaired Days* shows the five-year average of the current visibility (2005 through 2009) at Big Bend National Park compared to the five-year average of baseline visibility (2000 through 2004) along with the 2018 regional progress goal established in the 2009 SIP.

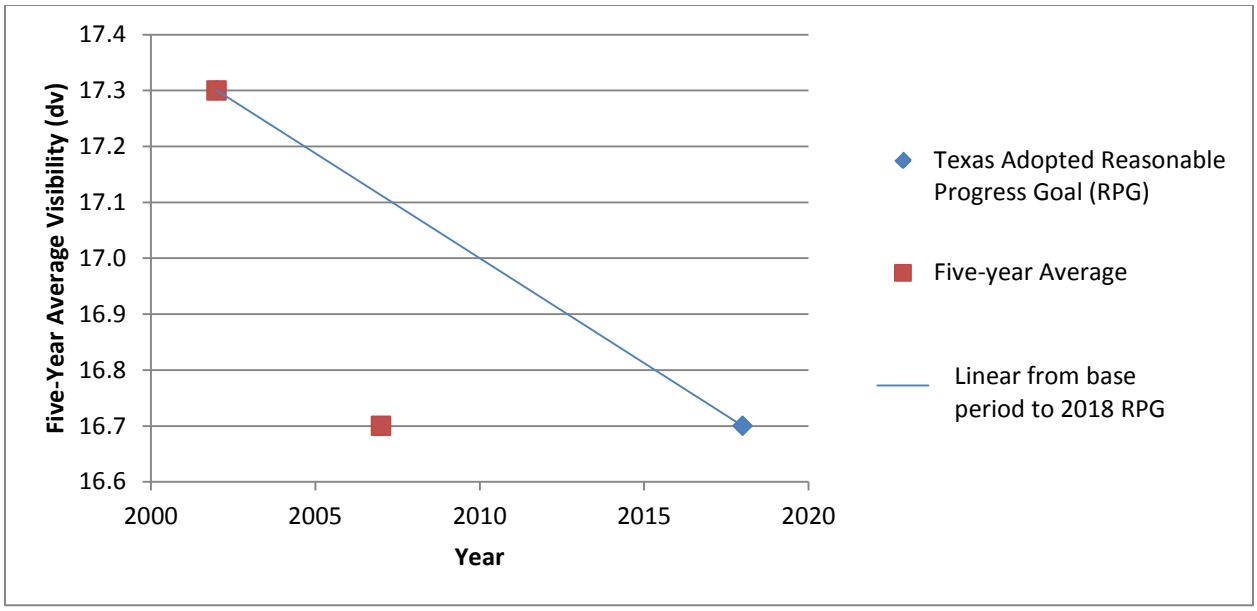



**Figure 5-1: Visibility Improvement at Big Bend National Park for 20% Most Impaired Days**

Figure 5-2: *Visibility Improvement at Guadalupe Mountains National Park for 20% Most Impaired Days* shows the five-year average of the current visibility (2005 through 2009) at Guadalupe Mountains National Park compared to the five-year average of baseline visibility (2000 through 2004) along with the regional progress goal established in the 2009 SIP.

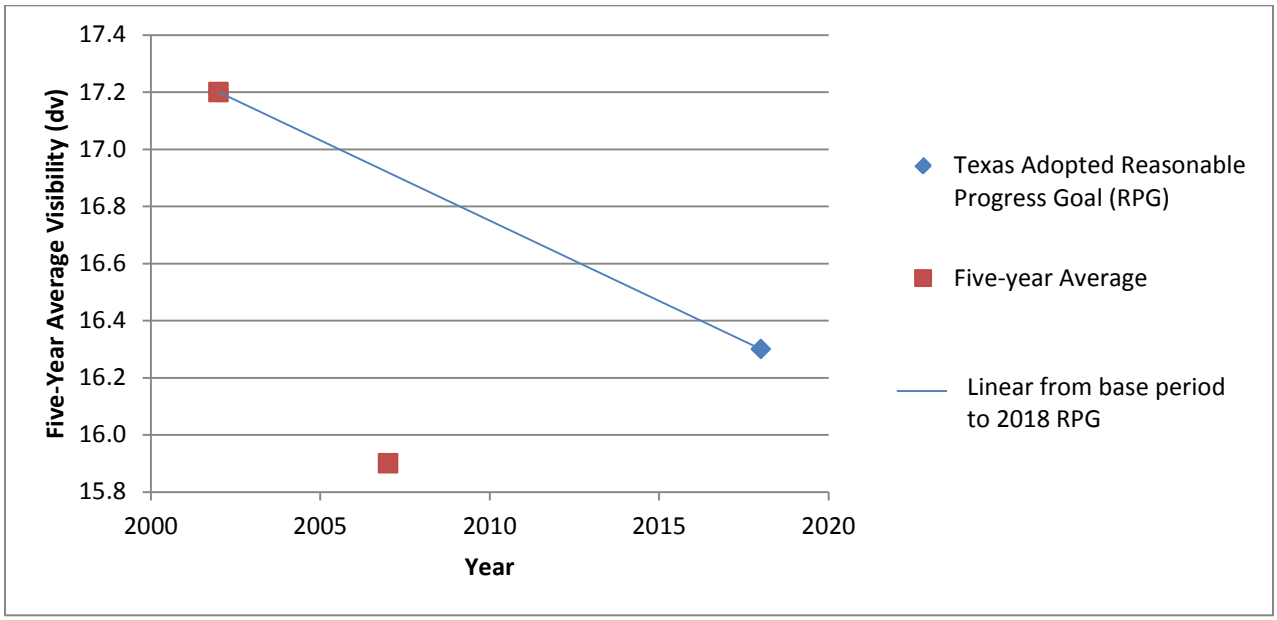



**Figure 5-2: Visibility Improvement at Guadalupe Mountains National Park for 20% Most Impaired Days**

Figure 5-3: *Visibility at Big Bend National Park for 20% Least Impaired Days* shows the five-year average of the current visibility (2005 through 2009) at Big Bend National Park compared to the five-year average of baseline visibility (2000 through 2004).

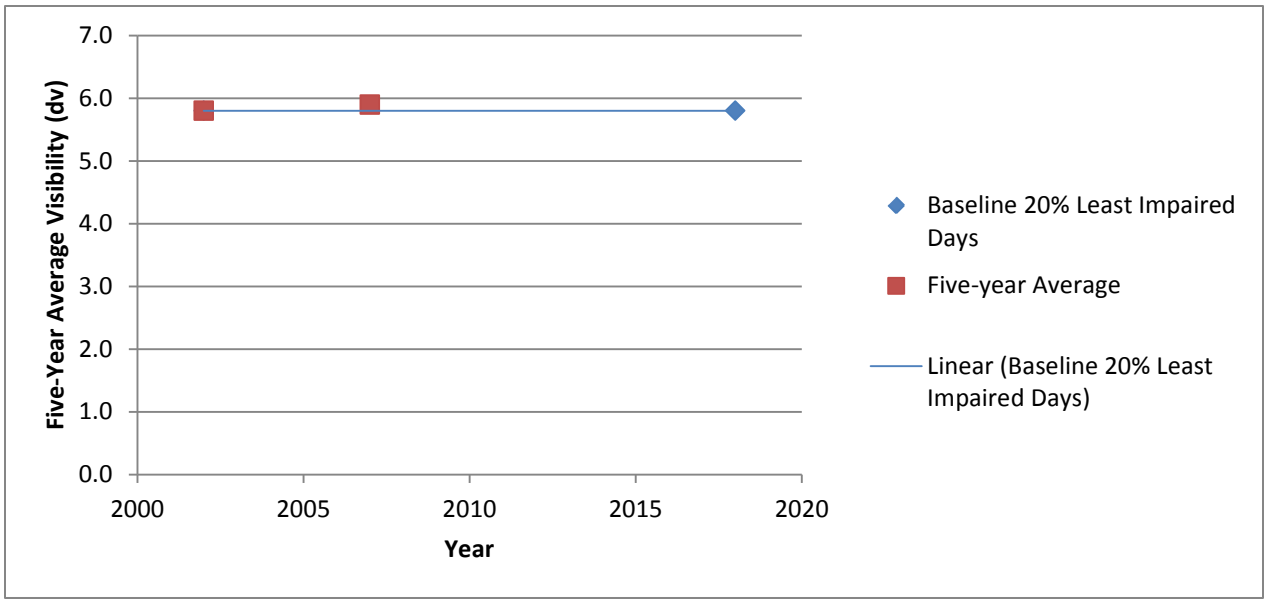



**Figure 5-3: Visibility at Big Bend National Park for 20% Least Impaired Days**

Figure 5-4: *Visibility at Guadalupe Mountains National Park for 20% Least Impaired Days* shows the five-year average of the current visibility (2005 through 2009) at Guadalupe Mountains National Park compared to the five-year average of baseline visibility (2000 through 2004).

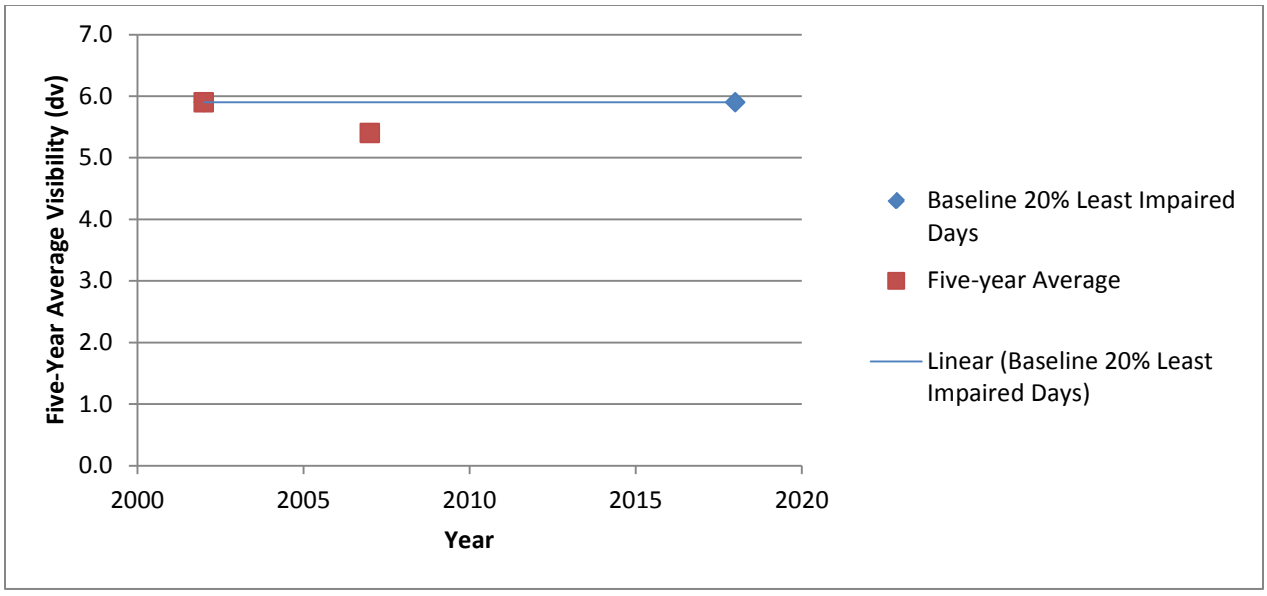



**Figure 5-4: Visibility at Guadalupe Mountains National Park for 20% Least Impaired Days**

Table 5-1: *Visibility for Class I Areas on 20% Most Impaired Days* and Table 5-2: *Visibility for Class I Areas on 20% Least Impaired Days* present the Interagency Monitoring of Protected Visual Environments (IMPROVE) data for Texas Class I areas and the nearby Class I areas that Central Regional Air Planning Association (CENRAP) modeling for the 2009 regional haze SIP indicates that Texas' emissions affect.

For the 2005 through 2009 average visibility impairment compared to the straight line drawn from the base period (2000 through 2004) average visibility impairment in deciviews to the 2018 reasonable progress goal (RPG), four Class I areas to the northeast of Texas are above the straight line at for the average impairment over the 2005 through 2009 five-year period; the four Class I areas are Caney Creek and Upper Buffalo Wilderness Areas in Arkansas, and Hercules Glade and Mingo Wilderness Areas in Missouri. The other Class I area to the north of Texas, Wichita Mountains Wilderness Area, is 0.1 dv below the line. The Class I areas in New Mexico and elsewhere affected by emissions from Texas are below their straight line from the base period impairment to the 2018 RPGs. The Class I areas to the northeast of Texas are heavily influenced by regional haze from the Midwest and Midsouth. Because of the substantial reductions in the key pollutants, $SO_2$ and nitrogen oxides ($NO_X$), from Texas that could affect visibility impairment to the northeast of Texas, it is unlikely that emissions from Texas are significantly responsible for the areas being above the straight line at this time. It is noteworthy that the requirement in the Rule is to assess the progress by 2018. There is not a requirement to be on or below the straight line interpolated between 2002 and 2018.

A slight positive difference between baseline and current value for the 20% least impaired days is found at Wichita Mountains Wilderness. As noted in Chapter 4: *Assessment Of Visibility* in this document, the TCEQ performed a T-test comparing the baseline to the current annual average visibility values for the 20% least impaired days at Wichita Mountains Wilderness and found that there was no statistically significant difference in visibility impairment between the two time periods. Details of this analysis are shown in Appendix G*: Statistical Calculations.*

The plot of year-by-year average visibility impairment in deciviews for the least impaired 20% of monitored days for the Wichita Mountains Wilderness shows notable year-to-year variation. This type of year-to-year variation is to be expected for visibility impairment values. Because of the random component in the year-to-year variation, occasionally one or more sites may show less than straight line improvement over a particular averaging period even though the overall picture is that sites throughout the area affected by emissions from Texas are broadly below the straight line improvement interpolated from the 2000 through 2004 baseline period to the 2018 RPG for each Class I area.

**Table 5-1: Visibility for Class I Areas on 20% Most Impaired Days**

| Class I Area | Baseline Five-year Average 2000 through 2004 (dv) | Current Five-year Average 2005 through 2009 (dv) | 2018 Reasonable Progress Goal (dv) | Current Visibility above or below RPG line (dv) |
|---|---|---|---|---|
| Big Bend National Park | 17.3 | 16.7 | 16.7 | -0.4 |
| Guadalupe Mountains National Park | 17.2 | 15.9 | 16.3 | -1.0 |
| Caney Creek Wilderness Area, Arkansas | 26.4 | 25.3 | 22.5 | 0.1 |
| Upper Buffalo Wilderness Area, Arkansas | 26.3 | 25.9 | 22.5 | 0.8 |
| Great Sand Dunes Wilderness Area, Colorado | 12.8 | 11.4 | 12.2 | -1.2 |
| Breton Wilderness Area, Louisiana | 25.7 | pending | 22.7 | pending |
| Hercules-Glades Wilderness Area, Missouri | 26.7 | 26.0 | 23.1 | 0.4 |
| Mingo Wilderness Area, Missouri | 28.4 | 27.1 | 23.7 | 0.2 |
| Bosque del Apache Wilderness Area, New Mexico | 13.8 | 13.4 | 17.3 | -1.5 |
| Carlsbad Caverns National Park, New Mexico | 17.2 | 15.9 | 16.9 | -1.2 |
| Salt Creek Wilderness Area, New Mexico | 18.0 | 17.5 | 17.3 | -0.3 |
| Wheeler Peak Wilderness Area, New Mexico | 10.4 | 9.1 | 10.2 | -1.2 |
| White Mountain Wilderness Area, New Mexico | 13.7 | 13.2 | 13.3 | -0.4 |
| Wichita Mountains Wilderness, Oklahoma | 23.8 | 23.0 | 21.5 | -0.1 |

**Table 5-2: Visibility for Class I Areas on 20% Least Impaired Days**

| Class I Area | Baseline Five-Year Average 2000 through 2004 (dv) | Current Five-Year Average 2005 through 2009 (dv) | Baseline Minus Current (dv) |
|---|---|---|---|
| Big Bend National Park | 5.8 | 5.9 | 0.1 |
| Guadalupe Mountains National Park | 5.9 | 5.4 | -0.5 |
| Caney Creek Wilderness Area, Arkansas | 11.2 | 10.7 | -0.5 |
| Upper Buffalo Wilderness Area, Arkansas | 11.7 | 11.7 | 0 |
| Great Sand Dunes Wilderness Area, Colorado | 4.5 | 3.6 | -0.3 |
| Breton Wilderness Area, Louisiana | 13.1 | pending | pending |
| Hercules-Glades Wilderness Area, Missouri | 12.8 | 12.5 | -0.3 |
| Mingo Wilderness Area, Missouri | 14.3 | 13.9 | -0.4 |
| Bosque del Apache Wilderness Area, New Mexico | 6.3 | 5.8 | -0.5 |
| Carlsbad Caverns National Park, New Mexico | 5.9 | 5.4 | -0.5 |
| Salt Creek Wilderness Area, New Mexico | 7.8 | 7.3 | -0.5 |
| Wheeler Peak Wilderness Area, New Mexico | 1.2 | 0.9 | -0.3 |
| White Mountain Wilderness Area, New Mexico | 3.6 | 3.3 | -0.1 |
| Wichita Mountains Wilderness, Oklahoma | 9.8 | 9.9 | 0.1 |

## 5.4 CHANGES IN EMISSIONS INVENTORY

As required in 40 CFR 51.308(g)(4), Texas analyzed changes in emissions of pollutants contributing to visibility impairment from all sources within the state and determined the major visibility impairing pollutants – $SO_2$, $NO_X$, coarse particulate matter ($PM_{10}$), and fine particulate matter ($PM_{2.5}$) – are decreasing. Figure 5-5: *Actual and Projected Statewide Emissions Trends for Select Pollutants* shows the decrease in inventoried state-wide emissions for carbon monoxide (CO), $SO_2$, $NO_X$, and $PM_{2.5}$. The graph shows the straight line projection from the 2002 base period and the 2018 prediction at the end of the first planning period and date by which the first reasonable progress goals are to be met. All these pollutants are below the straight line projection from the base period to the projected 2018 emission rate. $SO_2$, $PM_{2.5}$, and CO were in 2011 already below the projected 2018 level, on which the 2018 reasonable progress goals for the Class I areas were, in part, based.

Figure 4-2: *Actual and Projected Emissions Trends for Electric Power Generation* shows a straight line rate of decrease in $NO_X$ and $SO_2$ from the 2002 base inventory to the 2018 statewide emission levels for electric generating units (EGU) in Texas projected for the modeling conducted by CENRAP to provide the basis for states to project 2018 visibility impairment on the average of the 20% most impaired days and the 20% least impaired days. The statewide Texas EGU $NO_X$ emissions in 2011 were already below the projected 2018 emissions for meeting the 2018 reasonable progress goal. The statewide Texas EGU $SO_2$ emissions are below the straight line rate of decrease between the 2002 base period $SO_2$ emissions and the 2018 statewide EGU $SO_2$ emissions consistent with meeting the 2018 reasonable progress goals.

The analysis of the emissions inventory changes against the CENRAP projections supports the adequacy of the current strategy for meeting the reasonable progress goals for the Class I areas in Texas and the Class I areas that emissions from Texas impact in other states.

## 5.5 ASSESSMENT OF ANTHROPOGENIC EMISSIONS IMPEDING VISIBILITY

40 CFR 51.308(g)(5) requires that the periodic five-year assessment include an assessment of any significant changes in anthropogenic emissions within or outside the state that have occurred over the past five years that have limited or impeded progress in reducing pollutant emissions and improving visibility.

To address 40 CFR 51.308(g)(5), Texas is explicitly stating that Texas has no evidence that, within the United States, there have been significant changes in the anthropogenic emissions of concern within or outside the state that have limited or impeded progress in reducing pollutant emissions and improving visibility. Texas does not have sufficient recent information on changes in emissions in Mexico to assess whether emission changes there may or may not limit or impede progress in reducing pollutant emissions and improving visibility.

However, improvements in visibility at Big Bend and Guadalupe Mountains National Parks are substantially dependent upon reducing emissions from Mexico and Central America. The TCEQ, in its 2009 regional haze SIP submittal, specifically asked the EPA for federal efforts to reduce the international transport impacts on regional haze coming into the United States across Texas' southern border. Modeling estimates indicate that 52% of the visibility impairment at Big Bend National Park and 20% of the visibility impairment at Guadalupe Mountains National Park on the 20% of days with the greatest visibility impairment comes from international transport. The preamble to the July 1, 1999, issuance of the Rule clearly says that states are not required to carry out compensatory over control to make up for the lack of progress in reducing the impacts of international transport. In this SIP submittal, the TCEQ reiterates its request to the EPA to

initiate efforts to secure international emission reductions to reduce visibility impairment at Texas' Class I areas.

The following paragraphs and figures in this subsection provide evidence that weighs against the presence of significant emission increases that have limited or impeded progress in reducing pollutant emissions and improving visibility.

Figure 3-1: *Absolute Change in Deciviews from the Baseline Years Through Current Period for the 20% Most Impaired Visibility Days* shows the change in visibility impairment in deciviews from the base period of 2000 through 2004 to the next five-year period, which is 2005 through 2009. For the states of New Mexico, Colorado, and Wyoming east to the Atlantic Ocean (with the exception of sites near the Canadian border) all IMPROVE sites in Class I areas show reductions in visibility impairment on the 20% most impaired days. The broad area of the continental United States this includes encompasses all the states that have a significant impact on regional haze conditions in Texas as well as all the states with Class I areas affected by emissions from Texas. The absence of Class I areas with degradation in average visibility for the 20% most impaired days is consistent with the absence of significant emissions changes that have limited or impeded progress in improving visibility.

Figure 5-5: *Radar Plot Showing Average Contribution of Ammonium Sulfate to the Concentration of $PM_{2.5}$ in $\mu g/m^3$ at the Clinton Drive Monitoring Site in Houston, Texas for Two Periods: 2006 through 2008 and 2009 through 2011* shows the reduction from the period 2006 through 2008 to the period 2009 through 2011 in incoming visibility impairing pollution associated with ammonium sulfate to the Houston region. This analysis shows the reduction in ammonium sulfate, the most significant anthropogenic visibility-reducing pollutant, from Central, North, and East Texas and from the states to the northeast and east of Texas. These are key source areas contributing to ammonium sulfate transport into the two Class I areas in West Texas, and to transport from Texas into Oklahoma. The reductions over this short three-year period also show a reduction in source strength in the parts of Texas with the most important $SO_2$ source areas of Texas. These reductions also reduce Texas' visibility impairment impact on Class I areas in Oklahoma and in Arkansas and Missouri when they are downwind of Texas.

Ammonium sulfate is a major component of continental haze in the central and eastern United States. Positive Matrix Factorization applied to special study $PM_{2.5}$ chemical speciation data from the Clinton Drive monitoring site in Houston identified the ammonium sulfate-associated factor as the largest contributor to $PM_{2.5}$ mass and to visibility impairing pollution at this site. The figure shows the decrease in the average concentration of the ammonium sulfate factor from the 2006 through 2008 three-year period to the 2009 through 2011 period. On directions from the west-northwest clockwise through the east-southeast the figure shows reductions from one three-year period of 1 microgram per cubic meter ($\mu g/m^3$) or more from most directions. These directions are predominantly influenced by interstate transport of air from the continental United States. There are also reductions in the incoming ammonium sulfate associated aerosol from the southwest clockwise through the north, which are the directions of the majority of coal and lignite fired EGUs in Texas, as well as other ammonia and sulfate sources in the area. The reductions documented from one three-year period to the next are consistent with the projections of reduced impacts from sulfur dioxide emissions in Texas on ammonium sulfate aerosol and the consequent reduction of the impact of Texas emissions on visibility impairment at Class I areas in Texas and surrounding states.

Figure 5-5 is a radar plot of the average concentration in $\mu g/m^3$ of ammonium sulfate in $PM_{2.5}$ in air from each of the indicated sectors arriving at the Clinton Drive monitoring site in Houston

(Sullivan 2012; Sullivan et al. 2013). The concentrations of ammonium sulfate are shown for the averaging periods 2006 through 2008 and 2009 through 2011. In general, the concentration of ammonium sulfate is lower for the later set of years indicating a decrease in this most important visibility impairing pollutant arriving at this monitor from the upwind directions shown in the plot.

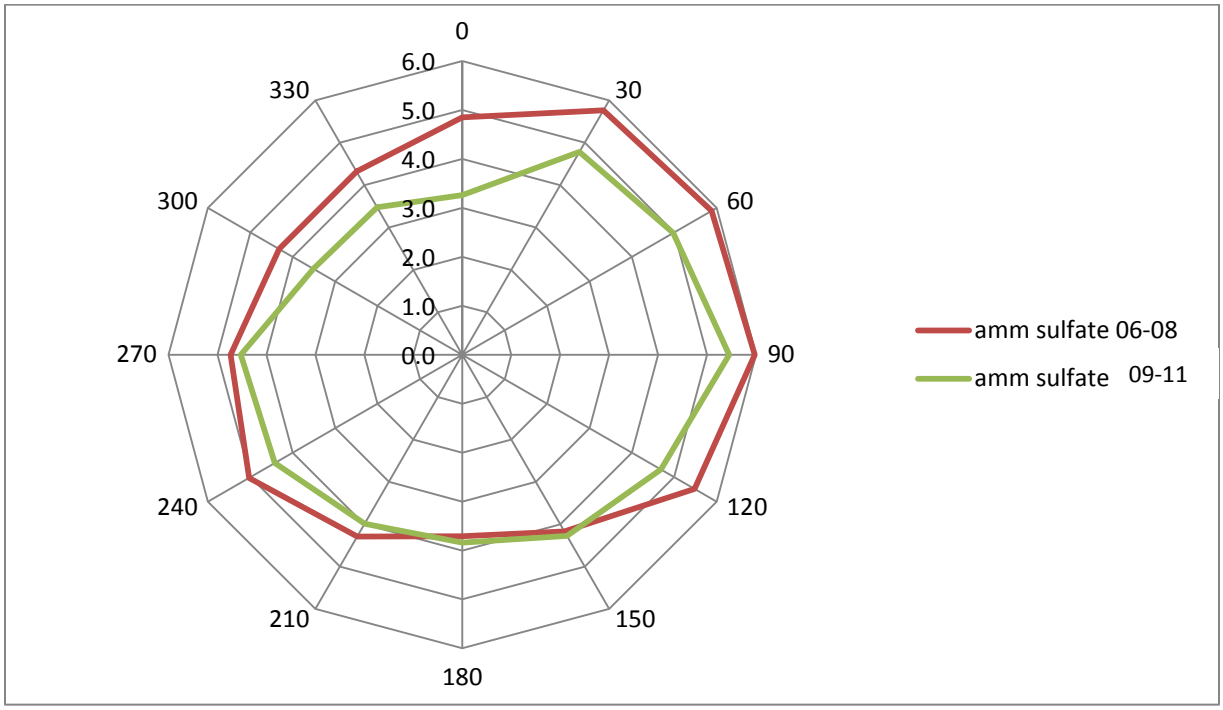



**Figure 5-5: Showing Average Contribution of Ammonium Sulfate to the Concentration of $PM_{2.5}$ in µg/m³ at the Clinton Drive Monitoring Site in Houston, Texas for Two Periods: 2006 through 2008 and 2009 through 2011**

## 5.6 SUMMARY ASSESSMENT

Texas concludes that the current SIP elements and strategies are sufficient to enable Texas and other states with Class I areas affected by emissions from that state to meet all established reasonable progress goals. The ammonium sulfate is the most significant anthropogenic contributor to visibility impairment in Texas. As shown in Figure 5-5, the contribution of regional transport of ammonium sulfate associated mass to $PM_{2.5}$ begin transported into the Houston region from Central and East Texas and from the states to the northeast and east of Texas has been reduced by approximately 1 µg/m³ from the 2006 through 2008 period to the 2009 through 2011 period. This reduction adds significant weight of evidence that the current SIP elements and strategies are effective in reducing anthropogenic contributions to visibility from sources in Central and East Texas and in states to the northeast and east of Texas. Based on evaluation of the information discussed in this SIP revision, the TCEQ concludes that the current strategy is adequate for Class I areas in Texas and in areas affected by Texas to meet all established reasonable progress goals.

# CHAPTER 6: MONITORING STRATEGY REVIEW – 40 CFR §51.308(g)(7)

## 6.1 INTRODUCTION

40 Code of Federal Regulations (CFR) §51.308(g)(6), of the regional haze rule (the Rule) requires a review of the state's visibility monitoring strategy and any modifications to the strategy as necessary. The Texas Commission on Environmental Quality (TCEQ) has reviewed Texas' visibility monitoring strategy and has determined that no revisions to it are necessary.

## 6.2 MONITORING AT CLASS I AREAS IN TEXAS

Currently, the Interagency Monitoring of Protected Visual Environments (IMPROVE) program provides an IMPROVE monitor at each of the two Class I areas in Texas, Big Bend and Guadalupe Mountains National Parks. Because of their location, the monitors are appropriate for determining progress in reducing visibility impairment in the Texas Class I areas. The TCEQ's monitoring strategy relies on continuation of IMPROVE monitoring at these sites. The TCEQ plans to continue to participate in the IMPROVE network through the financial support of the United States Environmental Protection Agency (EPA). No additional monitoring beyond the IMPROVE network is required or necessary for assessing visibility conditions at the two Class I areas in Texas or at the Class I areas that Texas' emissions affect in other states.

Continued IMPROVE monitoring at all current Class I IMPROVE sites that Texas' emissions impact is centrally important to the effort to monitor reductions in anthropogenic haze impacts at these sites. If funding for these IMPROVE sites is threatened, the TCEQ plans to work closely with the EPA, the federal land managers (FLM), and neighboring states to attempt to find the funding to continue the current Class I IMPROVE monitoring for these sites.

The TCEQ currently has a tapered element oscillating microbalance (TEOM) continuous monitor for fine particulate matter ($PM_{2.5}$) at Big Bend National Park. The monitor is not required or used to judge progress in reducing anthropogenic visibility impairment. That purpose is met entirely by the IMPROVE monitor at each Class I area in Texas. The data are, however, useful as supplemental information to aid in the analysis of dust storms impacts on visibility impairment at Big Bend National Park.

## 6.3 REPORTING VISIBILITY MONITORING DATA TO THE EPA

The TCEQ does not directly collect or handle IMPROVE data. The IMPROVE program makes its data available to the public, states, and the EPA. The TCEQ's support will be through requesting that both the EPA and other agencies that support it continue to do so.

If Texas collects any visibility-related monitoring data through the state and local air monitoring station (SLAMS) air quality monitoring network, the TCEQ will report those data to the EPA as specified under the Performance Partnership Grant agreement negotiated with the EPA Region 6. All validated data and data analysis results from any TCEQ visibility-related special studies are public information. The TCEQ plans to continue its practice of sharing the data and information with the EPA, the FLMs, and the public.

The data from the $PM_{2.5}$ TEOM monitor at Big Bend National Park are available from the TCEQ. The TCEQ reports the hourly average $PM_{2.5}$ concentrations measured by the Big Bend TEOM to the EPA's Air Quality System national air quality database. Additionally, the TCEQ hosts the National Park Service's Big Bend ozone data on the TCEQ web site (http://www.tceq.texas.gov/cgi-bin/compliance/monops/daily_summary.pl?cams=691).

# CHAPTER 7: ADEQUACY OF CURRENT REGIONAL HAZE SIP –40 CFR §51.308(h)

## 7.1 INTRODUCTION

In the regional haze rule (the Rule), 40 Code of Federal Regulations (CFR) §51.308(h) requires during the five-year progress report to United State Environmental Protection Agency (EPA) in accordance with paragraph (g) of this section, the state must also take the following actions based upon the information presented in the progress report:

- provide to the EPA a negative declaration which concludes that further revision of the existing state implementation plan (SIP) is not needed at this time;
- if the state determines that the SIP is or may be inadequate to ensure reasonable progress, the state must provide notification to the EPA and to the other states that participated in the regional planning process must also collaborate with its regional planning partners in developing additional strategies to address the plan's deficiencies;
- the implementation plan is or may be inadequate due to emissions from sources in another county, the state shall provide notification, along with available information, to the EPA; or
- where the state determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources within the state, the state shall revise its implementation plan to address the plan's deficiencies within one year.

## 7.2 NEGATIVE DECLARATION

Based on the analyses conducted, Texas has determined that the existing regional haze SIP revision is adequate for continued progress toward the established reasonable progress goals for the Class I areas in Texas and for Class I areas in other states impacted by Texas emissions. Texas has determined that revisions of the existing regional haze SIP are not needed at this time to meet the requirements of the Rule. The state will continue implementation of control measures included in the 2009 regional haze SIP revision. The next scheduled regional haze SIP revision is due by July 31, 2018.

Per the Rule requirements, Texas submits a negative declaration, which determines that its regional haze SIP is sufficient, based on the evidence in this SIP revision and the federal analysis documented in the 2011 Interagency Monitoring of Protected Visual Environments (IMPROVE) report. Texas also determines that no additional controls are necessary based on this five-year progress report.

# CHAPTER 8: CONSULTATION WITH FEDERAL LAND MANAGERS – 40 CFR §51.308(i)

## 8.1 INTRODUCTION

According to the regional haze rule (the Rule), 40 Code of Federal Regulations (CFR) §51.308(i) requires state and federal land manager (FLM) coordination. The state must identify in writing to the FLM the title of the official to which the FLM of any Class I area can submit any recommendations on the implementation of this subpart including, but not limited to identification of: impairment of visibility in any Class I areas; and elements for inclusion in the visibility monitoring strategy required by §51.305 and this section.

The Rule requires states to consult with FLMs during development and review of the five-year regional haze state implementation plan (SIP) revision. In development of this report, Central States Air Resource Agencies (CenSARA) coordinated communications between states and the FLMs in the following ways:

- A conference call was held on December 16, 2011, with the National Park Service, a federal land manager representative to discuss the FLMs expectation for the five-year progress report.
- A conference call was held on February 27, 2012, for CenSARA member states for an initial planning session.

Texas will consult with FLMs after the SIP proposal is approved by the commission, and the state will send the draft SIP revision to the FLMs and the United States Environmental Protection Agency (EPA) in June 2013. The Texas Commission on Environmental Quality (TCEQ) will make publicly available the FLMs and the EPA comments prior to the public comment period as required by the Rule. Texas will send the proposed SIP revision to FLMs and the EPA at least 60 days prior to the public review comment period. Texas will notify FLMs of public hearings to be held in September 2013. Texas will consider all comments of FLMs along with others from the public.

Texas will continue to coordinate and consult with FLMs on future SIP revisions, including progress reports, as well as during the implementation of programs having the potential to contribute to visibility impairment in the Class I areas.

## 8.2 CONSULTATIONS

### 8.2.1 Consultations with Federal Land Mangers

In 2011, the TCEQ had one consultation with the National Park Service (NPS) FLM for Big Bend and Guadalupe Mountains National Parks. CenSARA arranged for the central states to teleconference with the NPS FLM who would be reviewing the five-year regional haze SIPs; the FLM offered suggestions on the content of the five-year SIP revisions as no further guidance had been provided by the EPA since the 1999 Rule at the time of this document development. The NPS FLM representative suggested that states focus on the data in the 2011 Interagency Monitoring of Protected Visual Environments (IMPROVE) report, which analyzed the Class I area network data for five years, charted trends for each Class I area, and presented national trends. On April 12, 2013, the EPA released a guidance document to assist states in addressing the requirements for a five-year regional haze SIP revision [*General Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and EPA Regional Offices in Development and Review of the Progress Reports)*].

The Rule requires that this SIP revision be reviewed by the appropriate FLMs and EPA before the SIP goes to public comment. The rule requires FLMs and EPA be given 60 days to comment on Texas' SIP and that these comments are available to the public during the public comment period. As with the previous regional haze SIP revision, after the state receives comments from the federal agencies, the TCEQ and FLMs and/or the EPA may confer on the federal comments for intent, clarification, or other reasons.

### 8.2.2 FLM Comment Period

The FLM comment period is scheduled to open on June 19, 2013 and to close on August 20, 2013. Comments may be submitted to Margaret Earnest, MC 206, State Implementation Plan Team, Office of Air, Texas Commission on Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087 or faxed to (512) 239-6188. Electronic comments must be submitted through the eComments (http://www5.tceq.state.tx.us/rules/ecomments) system. File size restrictions may apply to comments being submitted via the eComments system.

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*Appendices Available Upon Request*

Margaret Earnest
margaret.earnest@tceq.texas.gov
512-239-4581