2015 Ozone NAAQS Designation Recommendations
Public Comments

CONTENTS

AUSTIN

CAPCOG 3

BEAUMONT-PORT ARTHUR

Golden Triangle Business Roundtable 4

BELL COUNTY

Office of Representative Molly S. White 5

CORPUS CHRISTI

Corpus Christi Air Quality Group 6

DALLAS-FORT WORTH

Two Individuals 7

27 Individuals 8

EL PASO

City of El Paso 10

El Paso Electric 13

El Paso Metropolitan Planning Organization 15

Greater El Paso Chamber of Commerce 16

Western Refining 18

HOOD COUNTY

Hood County Clean Air Coalition 23

One Individual 26

HOUSTON-GALVESTON-BRAZORIA

8-hour Ozone SIP Coalition 27

Bay City Chamber of Commerce and Agriculture 29
City of Cleveland 32
City of Dayton 36
City of Liberty 39
Liberty County 42
Texas Chemical Council 45

SAN ANTONIO

Alamo Area Council of Governments (AACOG) 48
Alamo Group, Lone Star Chapter, Sierra Club 52
CEMEX Construction Materials South, LLC 53
City of San Antonio and Bexar County 54
City of Seguin 56
Lhoist North America 61
Martin Marietta 62

MULTIPLE AREAS/GENERAL

AACOG/CAPCOG Joint Resolution 63
Association of Electric Companies of Texas 65
Environmental Defense Fund 66
Texas Oil and Gas Association 79
Sierra Club and Downwinders at Risk 81

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BASTROP BLANCO BURNET CALDWELL FAYETTE HAYS LEE LLANO TRAVIS WILLIAMSON

April 11, 2016

Kristin Patton
State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality
P.O. Box 13087, MC 206
Austin, TX 78711-3087

RE: 2015 Ozone NAAQS Designation Recommendations

Dear Ms. Patton:

CAPCOG appreciates this opportunity to provide input on the state's 2015 ozone NAAQS designation recommendation to the EPA. Our comments are as follows:

- We appreciate the TCEQ staff's preliminary recommendation that EPA designate all of the counties in the CAPCOG region as either "attainment" or "unclassifiable/attainment."
- We are also aware of the serious regulatory and economic consequences of a nonattainment designation and support approaches to the initial area designations for the 2015 ozone NAAQS that would minimize these risks. We respectfully suggest that the TCEQ's recommendation to the EPA could go further than the current proposal does to help minimize these risks.
- We suggest that the TCEQ consider modifying its recommendation to account for the range of measurement uncertainty EPA allows for ozone monitoring (+/- 7%) as part of its consideration of air quality data.
- Specifically, we suggest that the TCEQ recommend that EPA designate counties that have regulatory monitors with design values over the 2015 ozone NAAQS that are within the EPA's allowable range of measurement uncertainty for ozone (71 ppb - 75 ppb) as "unclassifiable," rather than as "nonattainment" as TCEQ staff have proposed.

We believe that EPA may be receptive to this approach, particularly if TCEQ highlights EPA's decisions in recent years to designate areas as "unclassifiable" for the 2008 ozone NAAQS and the 2012 $PM_{2.5}$ NAAQS due to monitoring uncertainty. We encourage the TCEQ staff to at least offer this approach as an alternative option to the Commissioners at the August 3rd meeting, even if the staff does not explicitly recommend it to the commissioners. Thank you again for the opportunity to provide input on this important process.

Sincerely,

Betty Voights
Executive Director

Golden Triangle Business Roundtable
2901 Turtle Creek Dr. Suite 440
Port Arthur, TX 77642
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Kristin Patton, MC 206
State Implementation Plan Team
Office of Air Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

April 25, 2016

"2015 Ozone NAAQS Designation Recommendations"

The Golden Triangle Business Roundtable is a Trade Association. GTBR strives to serves its membership by promoting a positive industrial relationship with the community and have a positive impact on the economic and environmental impact of these facilities in the Golden Triangle area.

We appreciate the opportunity to comment in support of the Texas Commission on Environmental Quality's (TCEQ) "***2015 Ozone NAAQS DESIGNATION RECOMMENDATIONS".*** The future of economic development in the Southeast Texas region is contingent on a quality environment. It is not by happen chance that our member companies have successfully operated in a fashion that resulted in a status of "attainment" with the ozone National Ambient Air Quality Standards – NAAQS as promulgated on October 1, 2015 by the Environmental Protect Agency. It has been accomplished through cooperation, intense planning and substantial investment. The counties of Jefferson and Orange are being recommended by the TCEQ for a designation of attainment with those ozone NAAQS.

In accordance with the Federal Clean Air Act requirements, the TCEQ Air Quality Division has recommended those Texas counties with regulatory monitors that have measured ozone design values below the 2015 ozone NAAQS to be designated in attainment. Subsequently, the Governor of Texas will make recommendation to the EPA for those counties achieving attainment status as a determined by the TCEQ. The Southeast Texas region's ambient air quality monitoring network administered by the South East Texas Regional Planning Commission (SETRPC) has successfully demonstrated the monitoring results to support the proposed designation of attainment for the aforementioned counties of Jefferson and Orange.

The Golden Triangle Business Roundtable robustly supports the TCEQ'S Recommendation to designate the Counties of Jefferson and Orange as in attainment with the current ozone NAAQS.

Respectfully yours,

Dennis K. "Bert" Black
Executive Director

Mailing Address – P.O. Box 1816 – Nederland, TX 77627

TEXAS HOUSE OF REPRESENTATIVES

MOLLY S. WHITE

STATE REPRESENTATIVE · DISTRICT 55

To: Kristin Patton
MC 206, State Implementation Plan Team, Office of Air, Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087
kristin.patton@tceq.texas.gov

From: Office of Texas House of Representative Molly S. White, HD 55

Subject: Written comments in response to the 2015 Ozone NAAQS Designation Recommendations.

Date: 14 April 2016

The Office of Representative Molly S. White appreciates the opportunity from the TCEQ to express comment on the 2015 State Ozone NAAQS Designation Recommendations. The current designation for Bell County as attainment permits District 55 to continue operating as usual, which is beneficial for our economy.

In addition, as it relates to the broader perspective of the EPA's overall strategy, we request that the TCEQ remain vigilant of the federal agency's expansive intent to create future burdensome regulations and obtain more control within Texas through the objective to expand CO2 regulations. Economic vitality and jobs are at stake when such expansions diminish freedom.

Office Contact

Hannah Bell
Chief of Staff, Texas House of Representative Molly S. White (HD 55)
Email: hannah.bell@house.texas.gov
Phone: 512-463-0630

CAPITOL EXTENSION, ROOM E2.702 · P.O. BOX 2910 · AUSTIN, TEXAS 78768-2910 · PHONE: 512-463-0630 · FAX: 512-463-0937

April 25, 2016

Kristin Patton
State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality
P.O. Box 13087, MC 206
Austin, TX 78711-3087

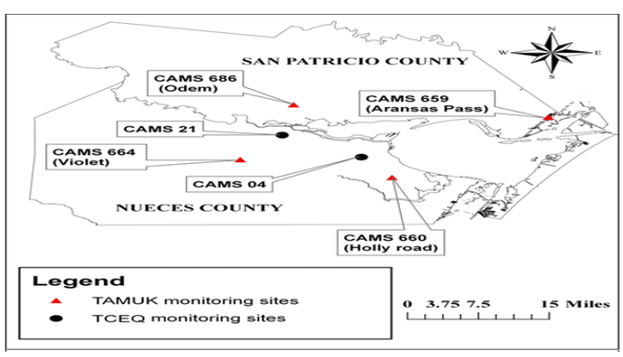
RE: 2015 Ozone NAAQS Designation Recommendations

Dear Ms. Patton:

The Corpus Christi Air Quality Group appreciates this opportunity to provide input on the Texas Commission on Environmental Quality's (TCEQ) 2015 ozone NAAQS designation recommendation to the EPA as reflected in a table found at https://www.tceq.texas.gov/assets/public/implementation/air/sip/ozone/2015Designations/Potential_State_Designation_Recommendations_2015ozone.pdf

- The Corpus Christi Air Quality Group appreciates and supports the TCEQ preliminary recommendation that EPA designate Nueces County as "attainment " and San Patricio County as "unclassifiable/attainment" for 2015 ozone NAAQS.

- From the time of their installation in 2006 to present, research monitors installed upwind of the Coastal Bend approved by TCEQ-and overseen by the Corpus Christi Air Quality Group have frequently measured inbound parcels of air from upwind sources that are in exceedance of the 2015 NAAQS for ozone of 70 ppb.
    - Should regulatory monitors for the Nueces County or San Patricio County air-shed indicate an exceedance of the 2015 NAAQS for ozone of 70 ppb, the area should be designated as unclassifiable/attainment until such time as a technology and process is established wherein transported emissions from beyond our jurisdictional boundaries are considered into our ozone attainment designation, and there is no regulatory monitoring uncertainty for sources of emissions.



Map of Upwind Research Monitors

Thank you for the opportunity for the Corpus Christi Air Quality Group to provide comment on the TCEQ recommendation to the U S EPA on 2015 ozone NAAQS designation recommendations.

Respectfully Submitted:

Gretchen Arnold

Gretchen Arnold

Chair, Corpus Christi Air Quality Group

Received from Two Individuals

From: [redacted]
To: Kristin Patton
Subject: Recommendations for 2015 Ozone NAAQS Designations
Date: Tuesday, March 15, 2016 5:54:57 PM

Regarding wet gas padsites in Texas, "MOST TANKS" use vapor recovery in Texas (to meet a 25 tpy VOC limit)...but in my North TX Barnett Shale "dry gas" urban drilling areas where the majority of the gas well padsites & compressors are under a "permit by rule", operators do not have to mitigate emissions under 25 tpy VOC's and **that is not protective of public health in a non-attainment to ozone federal standards in densely populated areas like in Tarrant county where I live.**

One to twenty-four tons per year VOC's is NOT safe for human health when you consider the aggregate build out of about 25,000 Barnett Shale wells in our already overtaxed urban air shed with vehicle emissions.

Please eliminate the allowable 25 tpy voc threshold in urban areas that are not under ozone attainment so that emission control equipment is mandated on every padsite and every piece of equipment capable of emissions. Please mandate catalytic converters on all lift compressors, and demand blowdowns to be diverted to a gas buster and require vapor recovery devices on storage tanks in all urban drilling areas that are in non-attainment to the federal ozone standard.

Thank you

[redacted]

[redacted]

Received from 27 Individuals

From: [redacted]
To: Kristin Patton
Subject: Re: 2015 Ozone National Ambient Air Quality Standard Designation Recommendations
Date: Thursday, March 31, 2016 2:00:03 PM

I support an expanded new boundary for the Dallas-Fort Worth non-attainment area for ozone pollution, including the counties where the five largest East Texas coal plants affecting the DFW air shed are located:

- Freestone
- Limestone
- Rusk
- Titus

These power plants are the largest industrial sources of smog-forming pollutants in the region. Computer modeling performed by the University of North Texas using the Texas Commission on Environmental Quality's own DFW ozone air model shows that controlling pollution from these five coal plants has more impact on DFW ozone levels than any other pollution-reduction strategy.

Strict control or elimination of pollution from these East Texas power plants would help bring DFW smog levels down significantly, to the point of meeting current ozone standards.

Most businesses in the current DFW non-attainment area emit a tiny fraction of the pollution coming out of these coal plants. Yet, they must comply with many emission-reduction measures, while these coal plants continue to escape the sort of regulation that comes with contributing to violations of the Clean Air Act.

DFW will only have safe and legal air to breathe when pollution from these coal plants is drastically reduced or eliminated.

Make coal fired power plants clean up their act!

Sincerely,

[redacted]

ESD
ENVIRONMENTAL SERVICES DEPARTMENT

Mayor
Oscar Leeser

City Council

District 1
Peter Svarzbein

District 2
Larry Romero

District 3
Emma Acosta

District 4
Carl L. Robinson

District 5
Dr. Michiel R. Noe

District 6
Claudia Ordaz

District 7
Lily Limón

District 8
Cortney C. Niland

City Manager
Tommy Gonzalez

April 15, 2016

Ms. Kristin Patton – MC 206
Texas Commission on Environmental Quality
State Implementation Plan Team, Office of Air
PO Box 13087
Austin, TX 78711-3087

Dear Ms. Patton,

Please accept the attached comments submitted on behalf of the City of El Paso related to the 2015 Ozone NAAQS Designation. Included in the comments, the City requests that TCEQ designate the County of El Paso as *in attainment* for the 2015 Ozone Standard "but for emissions" from Ciudad Juarez, Chihuahua, Mexico, or other factors allowed as evaluation criteria.

If you have any questions, please feel free to contact Ellen Smyth, P.E., Director of Environmental Services (smythea@elpasotexas.gov) or Karl Rimkus, Air Quality Program Manager at (915) 212-6053 (rimkuskc@elpasotexas.gov).

Sincerely,

Mark Sutter, Ph.D.
CFO, City of El Paso

Ellen A. Smyth – Director
7968 San Paulo Dr. | El Paso, Texas 79907 | (915) 212-6000
www.elpasotexas.gov

"Delivering Outstanding Services"

2015 Ozone NAAQS Designation Recommendations
Public Comments Provided by the City of El Paso
April 15, 2016

On behalf of the City of El Paso (City), the Environmental Services Department (ESD) submits the following public comments regarding possible nonattainment designation for the County of El Paso:

With the EPA's lowering of the ozone standard from 0.075 parts per million to 0.070 parts per million in 2015, the City is opposed to the nonattainment designation being recommended by TCEQ. The City is very concerned that according to information provided by TCEQ, only data from El Paso monitoring sites in close proximity to the international border with Mexico is to be used in evaluating attainment status. EPA guidance allows that meteorological data, geography/topography, and jurisdictional boundaries may be used as criteria in addition to air quality data and emissions data in determining nonattainment designation. Furthermore, EPA may approve (under 179B authority) a demonstration of attainment if the submitting state can satisfactorily demonstrate that "but for emissions emanating from outside the United States" the area would attain the ozone standard.

The County of El Paso shares a common airshed with Ciudad Juarez, Chihuahua, Mexico, with an estimated 2010 population of 1.3 million residents. The City of Juarez has a much older fleet of vehicles than El Paso, with none of the regulatory restrictions in place in El Paso County, including vapor recovery requirements, vehicle emission inspections and seasonal gasoline formula requirements. Additionally, there are four international ports of entry in El Paso County, which accounts for a significant amount of mobile source (vehicle) emissions of passenger automobiles, semi tractor-trailers and other commercial vehicles that idle for long periods of time awaiting entry into the United States:

> **More than 20% of all U.S./Mexico trade crosses through the El Paso/Juarez ports of entry,** nearly $80 billion last year...Pedestrians and **vehicles are often left in lines stretching up to three hours** in 100+ degree heat, for the privilege of spending their hard-earned dollars in our local economy. **There are examples of cargo waiting up to nine hours to cross on one of our bridges** -- a wait time so long that the shipper finally decided to air-freight his cargo instead of using our ports of entry.
>
> *- Beto O'Rourke*
>
> *Excerpt from statement from Congressman O'Rourke (bold type added for emphasis) accessed on March 31, 2016 at: https://www.betoforcongress.com/security-and-economic-growth*

While Congressman O'Rourke's statement addresses primarily an economic and international trade issue, the impact of long wait times for vehicles on the bridges at the ports of entry translates to concentrated areas of idling vehicles, which, when combined with the environmental factors present in the El Paso region, are a significant source of ozone pollution. Along with the lack of air quality regulation of vehicles in Mexico, the City and County of El Paso have no ability to control or regulate emissions of vehicles on the international bridges.

Therefore, a significant source of ozone pollution that contributes to lowering the quality of the City's airshed is beyond the ability of the City to control.

In closing, the City would like TCEQ to adopt the same rationale as used in El Paso's Ozone Plan approved by EPA in 2004, which recognized attainment status for ozone, "but for emissions" from Ciudad Juarez, Mexico, or other factors allowed as evaluation criteria.

P.O. Box 982
El Paso, Texas
79960-0982

April 15, 2016

Via Email

Ms. Kristin Patton, MC2-06
State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality
Austin, Texas 78711-3087
Email: kristin.patton@tceq.texas.gov

Re: 2015 Ozone NAAQS Designation Recommendations
El Paso Electric Company

Dear. Ms. Patton:

El Paso Electric Company (EPE) is a public utility that generates, transmits and distributes electricity across a 10,000 square miles service territory in the Rio Grande Valley of west Texas and south central New Mexico. With three different generating stations, including 12 permitted electric generating units (EGUs), located in El Paso County, EPE stands to be significantly impacted by the proposed Texas Commission on Environmental Quality (TCEQ) recommendation to the Environmental Protection Agency (EPA) that El Paso County be designated a nonattainment area under the 2015 ozone national ambient air quality standards (NAAQS). EPE submits the following comments regarding this designation recommendation.

While EPE recognizes that TCEQ's decision to recommend El Paso County as a new nonattainment area is based on the County having regulatory ozone monitors with a 2013 – 2015 design value exceeding 70 parts per billion (ppb), EPE respectively reminds TCEQ that these design values do not solely reflect the air shed over which TCEQ has jurisdiction. El Paso is a uniquely situated border city of which the air shed is undeniably influenced by industry and mobile sources on both sides of the international border. Emissions from Ciudad Juárez and cross-border traffic do and will contribute to peak ozone concentrations in EPE's service area[1].

Based on EPE's history of serving the border region, EPE reiterates EPA's conclusions that ozone and ozone pre-cursor emissions from international sources can prevent domestic ambient concentrations from

[1] *See, e.g.*, CONCEPTUAL MODEL FOR OZONE REDUCTION IN EL PASO, TEXAS 2-39 & 8-1 (Univ. of Texas at El Paso, 2011), *available at* http://rider8ep.org/downloads/EPMPORider8Final.pdf; *see, e.g.*, TCEQ, Air Pollution Events in Texas (Sep. 4, 2008), *available at* http://tinyurl.com/ElPasoOzone. ("The backward trajectories for the peak ozone hours at Ascarate Park CAMS 37 and Delphi C663 suggest that the sources contributing to the highest ozone were in Mexico."). EPA modeling supports this conclusion: Average "United States background concentrations"—defined as ozone levels that exist in the absence of any domestic anthropogenic emissions, s*ee* 79 Fed. Reg. at 75,382—range up to 45 ppb along the southern border *See* EPA's Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards, EPA-452/R-14-006, Figure 2-11 (Aug. 2014).

P.O. Box 982
El Paso, Texas
79960-0982

achieving attainment levels[2] and that the influence of international sources on domestic ozone levels is greatest along the United States' southern border[3]. EPE requests TCEQ's consideration of these findings when finalizing Texas' nonattainment recommendations. Furthermore, if El Paso County is to be classified as nonattainment, EPE writes in strong support of the use of Section 179B of the Clean Air Act to allow States to propose and EPA to approve of state implementation plans showing attainment of ozone standards "but for" international emissions.

In addition to international influences, EPE requests TCEQ consider data currently available or that which becomes available regarding exceptional events in making its final designation for El Paso County. As TCEQ is aware, El Paso County could become nonattainment due only to 2013-2015 data from a single monitor (at UTEP) of six certified monitors in the region, with that design value exceeding the 2015 standard by only 1 ppb. We understand that the dates on which El Paso's four highest design values in 2013-2015 are coincident with southwest wildfires (outside Texas), and an exceptional event demonstration could be developed to help justify attainment status.

Finally, EPE requests that any nonattainment designation recommendation that Texas will ultimately provide to the EPA specify that if the 2014-2016 design value for any of the three counties for which TCEQ is proposing to recommend as new nonattainment counties does not exceed 70 ppb, Texas' recommended designation for that county will change to attainment.

EPE looks forward to working with TCEQ in continued efforts to ensure the designation of El Paso County properly reflects the ambient air quality of the entire area designation and accounts for international and exceptional events. Also, EPE encourages TCEQ in making an ozone designation for El Paso County, to consider an unclassified status, or at most, partial county nonattainment, as appropriate and allowed within the existing regulatory framework.

Thank you for your favorable consideration of these comments.

Sincerely,

Linda J. Barker
Director – Environmental, Health & Safety

[2] *See* National Ambient Air Quality Standards for Ozone, 80 Fed. Reg. 65,298, 65,468 (October 26, 2015).

[3] *See id*. at 65,444.

El Paso Metropolitan Planning Organization

Transportation Policy Board
Oscar Leeser, Chair
Mayor, City of El Paso
Madeleine Praino, Vice-Chair
Mayor, Village of Vinton
Patricia Adauto
Public Works Director, El Paso County
Emma Acosta
City of El Paso Representative
Jay Banasiak
Director, Mass Transit
Robert Bielek, P.E.
District Engineer, TxDOT
César Blanco
Texas State Representative
Joseph Cervantes
New Mexico State Senator
Trent Doolittle, P.E.
District Engineer, NMDOT
Veronica Escobar
County Judge, El Paso County
David J. Garcia, PhD
Commissioner, Doña Ana County
Bealquin "Bill" Gomez
New Mexico State Representative
Mary E. Gonzalez
Texas State Representative
Tommy Gonzalez
City Manager, City of El Paso
Natasha Hernandez
Alderwoman, Town of Clint
Martin Lerma
Mayor, Town of Anthony
Monica Lombraña
Director of Aviation,
El Paso International Airport
Marisa Marquez
Texas State Representative
Ted Marquez
Director of Department of Transportation,
City of El Paso
Walter Miller
Alderman 1, Horizon City
Joe Moody
Texas State Representative
Cortney Niland
City of El Paso Representative
Michiel Noe, MD
City of El Paso Representative
Javier Perea
Mayor, City of Sunland Park,
New Mexico
Vincent Perez,
Commissioner, El Paso County
Joseph C. Pickett
Texas State Representative
Jesus Alejandro Ruiz
Mayor, City of Socorro
José R. Rodriguez
Texas State Senator
Maya Sanchez
Mayor, City of San Elizario, TX
Diana Trujillo
Mayor, City of Anthony, NM

Michael Medina, CNU-A
Executive Director

April 15, 2016

Kristin Patton
State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality
P.O. Box 13087, MC 206
Austin, TX, 78711-3087

RE: 2015 Ozone NAAQS Designation Recommendations

Dear Ms. Patton:

Thank you for the opportunity to submit comments on the State Designation Recommendations. The subsequent comments are respectfully provided for consideration during the process of determining the recommendation for El Paso County.

1) Due to the timing of the recommendation and the data set that is available at this time (2013-2015), it is suggested that El Paso County be recommended as an "unclassifiable/attainment" area since the 2016 data is not currently available and therefore not the most accurate representation of Ozone Emissions in El Paso County.

2) If the Design Value for El Paso County is close to the range of 70 PPB based on 2013-2015 data, it might be more accurate to recommend El Paso County as "unclassifiable/nonattainment" because a "non-attainment" recommendation might need to change if the 2016 data shows continued progress and attainment of the Ozone NAAQS.

3) It is suggested that El Paso Rider 8 Activities be counted as demonstration of continued progress toward meeting the Ozone NAAQS and therefore provide the basis for recommending El Paso County as "unclassifiable/attainment".

4) Lastly, in agreement with the Public Comment Letter by Capital Area Council of Governments (CAPCOG), it is also suggested that "the TCEQ recommend that the EPA designate counties that have regulatory monitors with design values over the 2015 Ozone NAAQS that are within the EPA's allowable range of measurement of uncertainty for Ozone (71 ppb – 75 ppb) as "unclassifiable" rather than as "nonattainment" as TCEQ staff have proposed".

Thank you once more for the opportunity to provide these suggestions/comments. Your review of the comments and consideration is greatly appreciated. If you have any questions please contact Christine Ponce-Diaz at 915-212-7106.

Sincerely,

Michael Medina, CNU-A
Executive Director

211 N. Florence Street, Suite 202 El Paso, Texas 79901 Phone: (915) 212-0258 Fax (915) 212-0257
www.elpasompo.org

GREATER EL PASO
CHAMBER OF COMMERCE

April 14, 2016

Kristin Patton
MC 206, State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087
Austin, Texas 78711-3087

Re: Comments Regarding the 2015 Ozone NAAQS Designation Recommendations

Dear Ms. Patton:

On behalf of more than 1,600 members, the Greater El Paso Chamber of Commerce is pleased to submit this comment concerning TCEQ's potential state designation recommendations and boundaries, in preparation of the Governor's recommendations to the Environmental Protection Agency for the 2015 revised ozone National Ambient Air Quality Standard (NAAQS).

Our goal is to avoid a nonattainment designation for El Paso County, and we feel there is more than ample basis for this finding.

Understanding the full scope of relevant information is important, and that includes exceptional events. Only one monitor in El Paso County, the UTEP monitor, exceeded the 2015 ozone standard of 70 ppb, reaching 71 ppb. However, considering possible exceptional events negates this limited deviation from the standards.

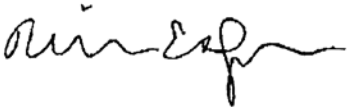
Absent considering exceptional events, facilitated by TCEQ's ability to develop successful exceptional event demonstrations, we encourage you to consider nonattainment areas smaller than a county.

El Paso has done great work in attracting jobs, but much work remains for City and County officials who will continue to recruit companies to our region. A nonattainment designation would result in greater burdens to obtain air permits because of emissions offset requirements for any new high-wage manufacturing jobs that might seek to come to the area. Such a designation would undermine achieved progress and significantly hinder future efforts.

Accordingly, we encourage you to incorporate exceptional events as you consider recommendations. Absent such consideration, we respectfully request you to limit the nonattainment area finding, rather than blighting the entire county with such a designation.

We thank you for the opportunity to comment on this critical step towards implementing the 2015 ozone NAAQS standard. Should you have any questions, please contact Jackie Butler at jbutler@elpaso.org or (915) 534-0528.

Respectfully,



Richard E. Dayoub
President and CEO

Marybeth Stevens
Chair, Governing Board

Western Refining

WNR LISTED NYSE

Kristin Patton
MC-206
State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Submitted by email to: Kristin.patton@tceq.texas.gov

Re: **State Designation Recommendations for the 2015 Ozone NAAQS, posted at: https://www.tceq.texas.gov/airquality/sip/eighthour.html**

Western Refining, Inc. ("Western") respectfully submits these comments regarding the Texas Commission on Environmental Quality (TCEQ) potential area designations and boundaries under the 2015 Ozone National Ambient Air Quality Standards (NAAQS). EPA lowered the ozone standard from 75 ppb to 70 ppb in October 2015, and these potential designations respond to the lowered ozone standard, in preparation for the Governor's recommendations to EPA on attainment and nonattainment designations for all Texas counties, due to EPA in October 2016. We appreciate the opportunity to provide comment on this important step towards implementing the 2015 ozone standard.

Western is an independent crude oil refiner and marketer of refined products, headquartered in El Paso, Texas. Western owns and operates two refineries, one in El Paso, Texas, and one near Gallup, New Mexico, with a combined capacity of 156,000 barrels per day. The wholesale segment includes a fleet of crude oil and finished product truck transports, and wholesale petroleum products operations in Arizona, California, Colorado, Georgia, Maryland, Nevada, New Mexico, Texas, and Virginia. The retail segment includes retail service stations and convenience stores in Arizona, New Mexico, and Texas. Western Refining, Inc. also owns the general partner and approximately 65% of the limited partnership interest of Western Refining Logistics, LP and the general partner and approximately 39% of the limited partnership interest in Northern Tier Energy, LP, including its refinery in Saint Paul Park, Minnesota.

In El Paso County, Western's business and operations provide a substantial positive impact. Western has approximately 500 employees in the El Paso area, in the refinery and company offices. Our average wage for these employees is one of the highest average wages in El Paso. We employ a number of contractors in addition to company employees. And we operate more than 25 retail gasoline stations with convenience stores in El Paso, providing additional employment. We are the largest property tax payer in the county. Western donates approximately $1,000,000 annually to local non-profit, charitable organizations; our charitable donations include scholarships and donations to nearby schools, among other things, and we are the largest contributor to the United Way of El Paso.

Western recommends that El Paso County be designated as "unclassifiable" at this time, without a designation of attainment or nonattainment. While the area has substantial ozone data and a designation could be made at this time, we strongly encourage TCEQ to pursue demonstrations showing the influence of apparent exceptional events on the

local air quality, as explained further below. Since the timeline to develop exceptional event demonstrations and obtain EPA approval extends well past the October 2016 deadline for the Governor's recommendations, the most appropriate recommendation at this time would be a designation of unclassified.

Furthermore, if TCEQ should not be successful in obtaining EPA approval for exceptional events, we recommend that TCEQ consider a designation of nonattainment for a very small portion of the county, only, rather than the entire county.

While international emissions also have a substantial impact on the local air quality, any reliance on a §179B demonstration of international impact on the ability to attain the ozone standard should only be considered after pursuing exceptional events and, if that fails, a recommendation of nonattainment for only a very small portion of El Paso County. This order of consideration fits EPA's timeline for implementing the 2015 ozone standard and best meets the economic needs of the El Paso community.

Finally, we support TCEQ's current plan to recommend designating adjacent Hudspeth County as unclassifiable/attainment.

Sources of Ozone

Ozone results from many sources of emissions including man-made or so-called anthropogenic emissions and emissions from natural sources including biogenic emissions from living sources plus emissions from other natural sources. These two source categories each include various sources within them:

- Anthropogenic emissions include local point, area, and mobile sources <u>and</u> international emissions including point, area, and mobile sources located in other countries.
- Natural emissions include biogenic emissions from plants <u>and</u> emissions resulting from natural events such as wildfires, stratospheric ozone intrusion, and lightning.

El Paso County ozone likely arises from a combination of some or all of these sources.

EPA's December 30, 2015, paper on background ozone, "Implementation of the 2015 Primary Ozone NAAQS: Issues Associated with Background Ozone, White Paper for Discussion", provides useful information about the background ozone in the El Paso area:

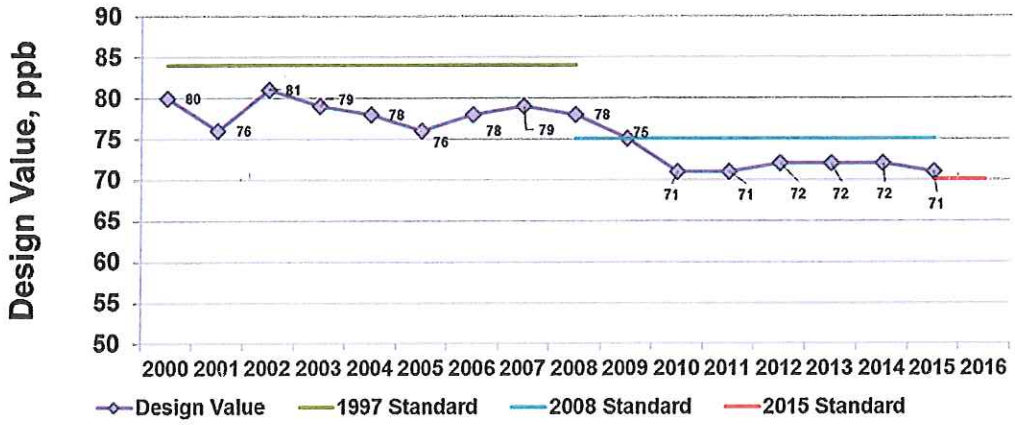
- Figure 1 on page 16 shows the results of "zero out modeling", indicating that 36 to 40 ppb of ozone in El Paso County results from other than US man-made emissions, in other words biogenic and other natural emissions including exceptional events plus international emissions.
- Table 2c on page 24 shows that only 20% of the 2017 design value in El Paso County results from manmade US sources.

These pieces of information compared to El Paso's current design value of 71 ppb suggest that reducing or eliminating the influence of either international emissions (largely from nearby Mexico) or exceptional events would likely bridge the gap between the current ozone levels in the area and attainment of the ozone standard.

El Paso County Ozone Design Value History

Based on 2013 to 2015 data and without considering exceptional events, the design value for El Paso County ozone would be 71 ppb, a level just above the level of the standard.

Thus, identifying just a small number of exceptional events for the area could mean the difference between an attainment designation and a nonattainment designation.



Potential Exceptional Events in El Paso County

El Paso County is located within the intermountain west, a large geographic area where the two most common types of exceptional events, wildfires and stratospheric ozone intrusion, may occur regularly.

Western Refining has embarked on a technical evaluation of potential exceptional events dates for the 2013 to 2015 ozone design value designation. While we have identified five apparent exceptional event dates for the three-year period, a demonstration for just two of these dates – June 2, 2014, and June 21, 2015 – would result in a design value of 70 ppb for this period. The other apparent exceptional event dates for this design value period – July 3, August 17, and August 19, 2013 – provide additional supporting evidence of the frequency of such events impacting El Paso ozone measurements.

We urge TCEQ to review these dates, especially the dates in 2014 and 2015, to determine whether appropriate exceptional event demonstrations can be submitted to EPA in a timely manner to result in an attainment ozone designation for El Paso County. Focusing on the 2014 and 2015 dates could provide useful exceptional event demonstrations for the 2014 to 2016 time period that EPA will use to ultimately establish final designations.

Boundary of Potential Nonattainment Area

In the event that TCEQ cannot develop an adequate exceptional events package to receive EPA approval, we recommend that TCEQ then consider applying the nonattainment designation to only a very small portion of El Paso County.

The only monitor in El Paso County with a design value based on 2013 to 2015 data that exceeds the 2015 ozone standard of 70 ppb is the UTEP monitor (C12). In fact, the last time any monitor in El Paso County other than the UTEP monitor had a 4th high reading above 70 ppb was in 2011, when the Skyline Park monitor measured a 4th high of 71 ppb on July 29, 2011. With a several year history of 4th high ozone readings at all El Paso monitors except the UTEP monitor measuring at or below the level of the 2015 ozone

standard, it seems appropriate for TCEQ to consider a nonattainment designation for only a narrow part of the County that would include the UTEP monitor but no other monitors.

Concerns Regarding a Possible Nonattainment Designation

El Paso County has a relatively low average income level. Many area jobs come from retail operations, call centers, and directly or indirectly to support the very large Fort Bliss Army Base. The County has only two large point source manufacturers with the accompanying higher wage base typical of manufacturers, the Western refinery and El Paso Electric's electric generating operations.

The City and the County work hard on a continual basis to attract good jobs with good wages to the area. A nonattainment designation and the accompanying greater burden to obtain air permits due to emissions offset requirements for major new air emissions could be very detrimental to future efforts to attract good high-wage manufacturing jobs to the area.

Considering the very close proximity of El Paso County to New Mexico, should the state of New Mexico be able to designate adjacent Dona Ana County as entirely in attainment by utilizing the exceptional event process or limit any nonattainment designation to the very small geographic portion of the County with a design value (not considering exceptional events) greater than 70 ppb, companies seeking to put new job positions in the El Paso area could very easily locate those jobs across the border in New Mexico. Such companies could thus avoid the difficulties of air permitting and emissions offsets in a nonattainment area, if TCEQ should not be successful at applying exceptional events to El Paso County and EPA designates El Paso County as nonattainment. But, these jobs would be lost from Texas.

International Emissions and §179B Demonstration

Under the now-revoked 1997 1-hour ozone standard, El Paso County was designated as nonattainment and TCEQ adopted a §179B demonstration showing that El Paso County could attain the standard "but for" emissions from Mexico. While the §179B demonstration remains an option for TCEQ to consider for El Paso County under the 2015 ozone standard, the demonstration still results in a nonattainment designation, the accompanying requirement to offset new air permit emissions for major permitting, and the associated potential detrimental impact to new manufacturing jobs coming into this area of Texas.

For this reason, while we understand that some significant amount of El Paso ozone air pollution results from international emissions, we recommend that TCEQ pursue first the exceptional events demonstration, and, should that not be successful, then a small nonattainment area boundary, and finally only as the third alternative, a §179B demonstration, perhaps in conjunction with a small nonattainment area boundary.

Hudspeth County

Western Refining does not have operations at this time in Hudspeth County. Nonetheless, we support TCEQ's potential area designation for Hudspeth County of unclassifiable/attainment. Supporting evidence of actual air quality can be found in El Paso County air monitoring data. In El Paso County, only the UTEP monitor has a design value above the level of the 2015 ozone standard but the UTEP monitor is relatively far from the less populated Hudspeth County.

Conclusion

Western Refining appreciates the opportunity to comment on the potential area designations and boundaries for El Paso County and Hudspeth County, under the 2015 ozone standard. The information at hand coupled with the design value just 1 ppb above the standard suggest that pursuing exceptional events demonstrations for El Paso County would be most preferable or, should exceptional events not result in EPA approval, then to consider a very narrow boundary for a nonattainment area that would include the UTEP monitor but no other monitors. Only after considering these options should TCEQ consider a §179B demonstration for the area, perhaps in conjunction with a very narrowly outlined nonattainment area. Furthermore, Western Refining supports the designation of unclassifiable/attainment for adjacent Hudspeth County.

If you have any questions on the information contained in this email, please contact Marise Textor at 915-474-7897 or marise.textor@wnr.com.

Sincerely,

Leslie Ann Allen
Senior Vice-President, Environmental

cc: David Brymer – david.brymer@tceq.texas.gov
Donna Huff – donna.huff@tceq.texas.gov
Erik Gribbin -- erik.gribbin@tceq.texas.gov

Hood County Clean Air Coalition
P.O. Box 743 Granbury, TX 76048
Tel 682-936-4049
www.hoodcountycleanair.com

March 18, 2016

Kristin Patton
MC 206
State Implementation Plan Team
Office of Air
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Dear Ms. Patton,

The Hood County Clean Air Coalition wishes to offer this letter regarding the TCEQ potential to recommend Hood County for a nonattainment designation for the 2015 Ozone NAAQS. The Hood County Clean Air Coalition is a proactive organization comprised of businesses, schools, local government, and citizens whose goal is to promote clean air in Hood County, Texas. Air quality in Hood County continues to improve. The design value of 73 parts per billion (ppb) for the years 2013-2015 represents the lowest design value associated with the Hood County monitor since it was installed in 1999. The 73 ppb design value, while meeting the 2008 Ozone NAAQS of 75 ppb, is above the new 2015 Ozone NAAQS of 70 ppb. It is important to note, however, that an Ozone Conceptual Model for Hood County, completed under the TCEQ Rider 8 Air Quality Planning Grant, with a source apportionment analysis, indicated that transport is a significant contributor to ozone in Hood County. The source apportionment, using data from the 2006 ozone episode, indicated that for days with ozone above the 2008 Ozone Standard of 75 ppb, Hood County contributions could be associated with 1.9 ppb while transport was associated with 74 ppb (Parker, et al., 2015). This is shown in Figure 1. It also indicated that transport from five other areas in Texas were higher contributors to ozone in Hood County than the county itself (Parker, et al., 2015). This is shown in Figure 2. While the influence of transport is considered, but not enough to avoid a potential nonattainment designation, it is important to note this influence for future control measure considerations.

<u>Citation:</u>

Parker, L., J. Zagunis, S. Kemball-Cook, and G. Yarwood. 2015. Conceptual Model of Ozone in Hood County. Report prepared for Michelle McKenzie, Hood County Clean Air Coalition, 123 E. Pearl St. #200, Granbury, TX 76048. April 2015.

Figure 1. Episode average contribution to daily maximum 8-hour ozone for the Granbury (CAMS 73) monitor from Hood County emissions sources ("local") and all emissions sources outside of Hood County ("transport") *Data Source: Parker et al., 2015*

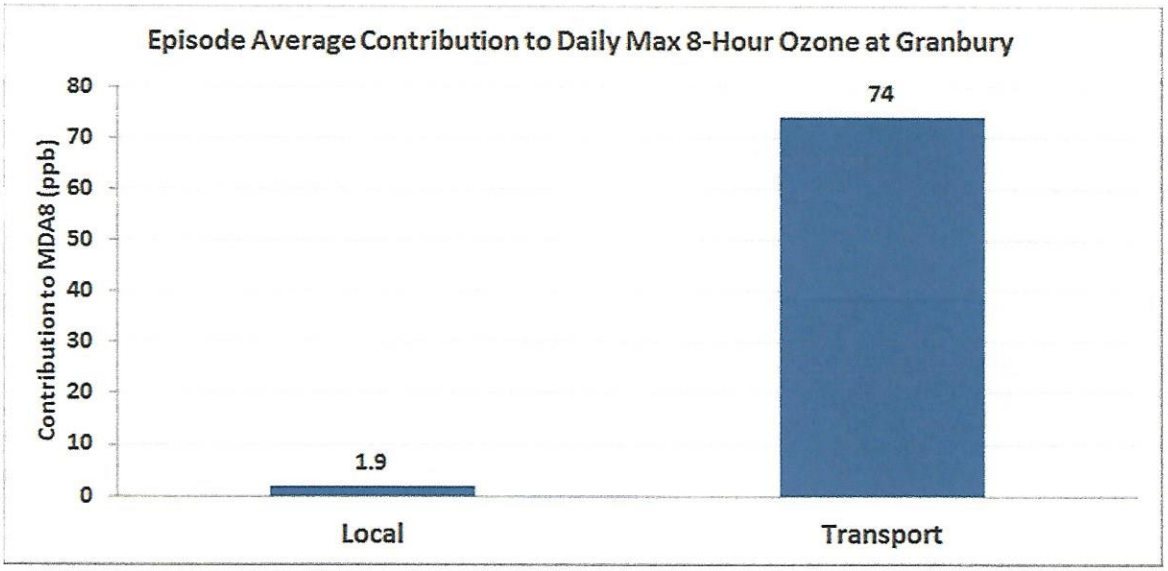
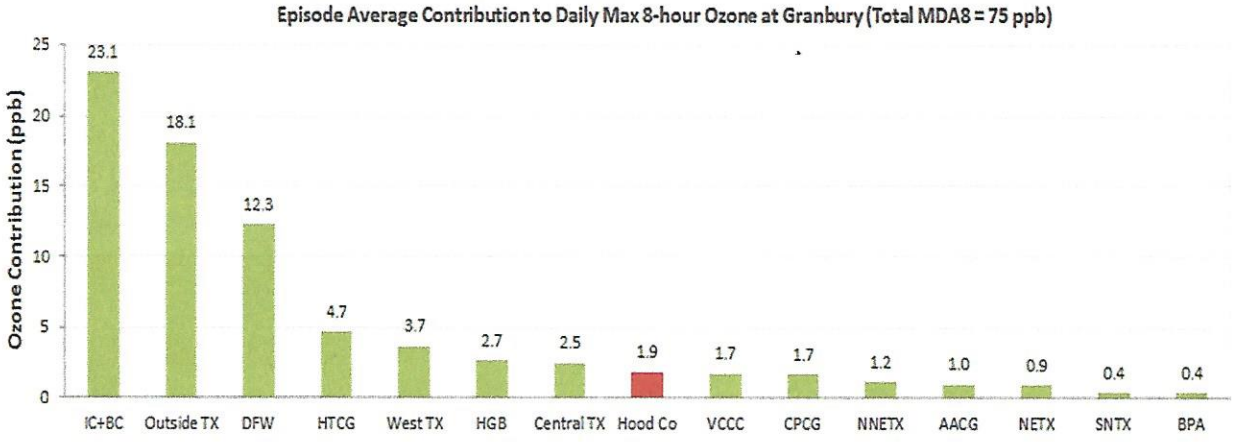


Figure 9. Granbury (CAMS 73) detailed source apportionment by region for the episode average contribution to daily maximum 8-hour ozone. *Data Source: Parker et al., 2015*



Citation:

Parker, L., J. Zagunis, S. Kemball-Cook, and G. Yarwood. 2015. Conceptual Model of Ozone in Hood County. Report prepared for Michelle McKenzie, Hood County Clean Air Coalition, 123 E. Pearl St. #200, Granbury, TX 76048. April 2015.

The Hood County Clean Air Coalition has spent the last few years partnering with regional groups like Air North Texas and DFW Clean Cities in efforts to raise awareness for regional clear air efforts and will continue to work closely with our regional partners to reduce ozone formative emissions in hopes of bringing the North Texas region into compliance with the ozone standard. Thank you for your consideration of our concerns.

Sincerely,

Hood County Clean Air Coalition Executive Board

Dave Porcher, Chairman

Bob Cornett, Mayor of Cresson

James Deaver, Hood County Commissioner

Mark Clark, Luminant

Mark Franco, Total Equipment and Service

Nin Hulett, Mayor of Granbury

Terry Johnson, Mayor of Tolar

John Campbell, Diamond C

Joe Drew, Vista Sand

Received from One Individual

From: [redacted]
To: Kristin Patton
Subject: Comments from Hood County concerning Designation Recommendation
Date: Friday, March 18, 2016 11:43:26 AM

Kristin Patton
State Implementation Plan Team - Office of Air
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Good Morning Kristin,

I am responding to you about the reclassification of Hood County. I am not a member of the Granbury Clean Air Collation that meets once a month, but I do attend their meetings as a citizen of Hood County. I am concerned about the possibility of our county being placed in the Non-attainment status.

I understand that this problem happens in different counties, but we do have a great number of vehicles that pass through our area that delivers products that are necessary for daily living, and we have no control over that issue. We do have the counties to the East of us that have the same issue with traffic that go through their city's and towns such as ours? The difference is that those cities have a larger population that we do? And when the wind blows in our direction we are the receiver of their pollution. I know that this is a hard decision, that you as a TCEQ employee has to make, but I hope that you will consider the cost it will incur on our citizens of Hood County if we are put in a position of raiseing fees for something we have no control over.

Thank you for you time and interest in this issue.

Sincerely,

[redacted]

8-Hour Ozone SIP Coalition

April 15, 2016

Kristin Patton
MC 206, Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Re: Comments of 8-Hour Ozone SIP Coalition
State Designation Recommendations for the 2015 Ozone NAAQS

Dear Ms. Patton:

The 8-Hour Ozone SIP Coalition (Coalition) appreciates the opportunity to comment on the Texas Commission on Environmental Quality's (TCEQ) potential area designations and boundaries under the 2015 ozone NAAQS for consideration in developing state designation recommendations. The Coalition's members are energy and petrochemical companies with the common goal of achieving clean air and a strong economy for Texas. The Coalition uses science to understand the underlying drivers of ozone formation, and our members have invested billions of dollars in state-of-the-art emissions controls since 2001. These measures have achieved unprecedented ozone precursor emission reductions in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area and contributed to a substantial reduction in statewide ozone levels.

Of note, from 2000 to 2014, the HGB population increased by 38%, while the eight-hour ozone design value decreased by 29%. In addition, the HGB area is measuring attainment of the one-hour ozone standard, which has decreased by 44% since 2000, and is at all time low concentrations.

The Coalition concurs with TCEQ's proposed designations and boundaries for HGB. Specifically, the Coalition supports TCEQ's recommendation that counties with regulatory ozone monitors measuring over the 2015 ozone NAAQS of 70 parts per billion (ppb) be designated nonattainment and that areas currently designated as nonattainment for the 2008 ozone standard be recommended as nonattainment areas for the 2015 ozone standard.

The Coalition supports TCEQ's recommendation that the latest available ozone monitoring data from 2013 through 2015 be used in this recommendation. The Coalition further supports retaining the current boundaries for the Houston/Galveston/Brazoria (HGB) nonattainment area. This includes the following counties: Brazoria, Chambers, Ft. Bend, Galveston, Harris, Liberty, Montgomery, and Waller.

The Coalition requests that TCEQ also consider relevant information regarding potential exceptional events in designating areas within the state. For example, ozone NAAQS exceedances in certain regions (such as El Paso) appear to correspond in time with wildfires that may qualify as exceptional events. Areas with ozone levels influenced by exceptional events

should not be designated nonattainment if excluding the exceptional events would yield an ozone design value that meets the NAAQS.

The Coalition appreciates your consideration of these comments. If you have any questions, please contact me.

Sincerely,

Elizabeth Hendler
Project Coordinator
[redacted]

April 26, 2016

David Brymer
Director, Air Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087, MC 206
Austin, TX 78711-3087
david.brymer@tceq.texas.gov

RE: Proposed State Designation Recommendations for Texas Counties

Dear Mr. Brymer,

Thank you for the opportunity to submit comments regarding the proposed nonattainment designations for the 2015 Ozone NAAQS. The Bay City Chamber of Commerce and Agriculture supports TCEQ's decision to classify Matagorda County as attainment.

Based upon many factors, including declining emissions and population, EPA designated Matagorda County as attainment in 2012 for the 2008 Ozone NAAQS. As discussed below and on Attachment A, these factors have not changed since 2012. The county's population remains the same since 2012 and, in fact, emissions have continued to decline. Matagorda County does not have a monitor for air quality data, therefore, the following provides comments on the additional four factors EPA evaluates as considerations for nonattainment designations:

Emissions. As shown on Attachment A, NOx and VOC emissions have continued to decline from the levels evaluated in 2012 for the 2008 NAAQS designations.

Meteorology. With negligible and declining emissions, TCEQ noted in support of the Matagorda County attainment designation in 2012 that high background ozone levels in the Houston region come from the east and northeast, not from the southwest where Matagorda County lies. *Technical Analysis Support Documentation by the [TCEQ] Regarding [EPA] Responses to State and Tribal 2008 Ozone Designation Recommendations.*

Jurisdictional Boundaries. Bay City, in Matagorda County, is a micropolitan area that is included in the larger Houston-Baytown-Huntsville Combined Statistical Area ("CSA"). Bay City Chamber does not support EPA's use of CSAs, a tenuous and variable census statistical designation, as a valid jurisdictional boundary for ozone NAAQS designation evaluations.

Geography/topography. Geographic features have not been identified to date as a significant factor impacting ozone formation and levels in or around southeast Texas.

BAY CITY
CHAMBER OF COMMERCE AND AGRICULTURE

Additionally, a recent study conducted by the Capital Area Council of Governments Air Quality Program estimated that a new nonattainment designation would impose an estimated $1,000,000,000 a year over 28 years. *The Potential Costs of an Ozone Nonattainment Designation to Central Texas* (September 22, 2015). While this is only an estimate and would vary by region, the impacts would be real, particularly for small to mid-size regions with stretched governmental resources and communities striving for greater economic development.

For the reasons stated above and on Attachment A, the Bay City Chamber of Commerce and Agriculture supports TCEQ's decision to designate Matagorda County as attainment.

Sincerely,

Mitch Thames

Mitch Thames
President and CEO
Bay City Chamber of Commerce and Agriculture

P.O. Box 768 ★ Bay City, Texas 77404-0768 ★ 979/245-8333 ★ 800/806-8333 ★ Fax 979/245-1622

Attachment A
Matagorda County Data Comparison

Matagorda County's National Emission Inventory ("NEI") data and population has declined or remained constant since EPA designated Matagorda County attainment under the 2008 ozone NAAQS in 2012.

The following chart generally compares the 2008 NEI data, used in 2012 to designate Matagorda County as attainment, to the most recent NEI data from 2011. TCEQ Emissions Inventory is used for point source emissions.

NEI for anthropogenic sources	**NOx tpy**	**VOC tpy**
2008 TCEQ-corrected NEI	4,079[1]	18,983[1]
2011 NEI	3,640[2]	7,989[2]
Point Sources (TCEQ Emissions Inventory)	**NOx tpy**	**VOC tpy**
2008 EI	1,153[3]	582[3]
2011 EI	777[3]	657[3]
2014 EI	739[3]	478[3]
On-road NEI	**NOx tpy**	**VOC tpy**
2008 NEI	1,167[4]	375[4]
2011 NEI	439[2]	303[2]
Area Oil and Gas Production NEI	**NOx tpy**	**VOC tpy**
2008 NEI	1,272[4]	14,662[1]
2011 NEI	673[2]	3,857[2]
Non-road NEI	**NOx tpy**	**VOC tpy**
2008 TCEQ-corrected NEI	1,152[3]	2,489[3]
2011 NEI	1,667[2]	2,127[2]
Census population estimates	**Population**	
2010	36,702[1]	
2011	36,699[5]	
2015	36,770[5]	

[1] EPA's Technical Support Document, *Houston –Galveston Brazoria, Texas Final Area Designations for the 2008 Ozone National Ambient Air Quality Standards.*

[2] Estimated from EPA's 2011 NEI data website at https://www.epa.gov/air-emissions-inventories/2011-national-emissions-inventory-nei-data (visited on April 20, 2016). Estimated data may vary with revisions or state-specific local analysis.

[3] Provided by TCEQ's Air Quality Division on February 17, 2016.

[4] Estimated from EPA's 2008 NEI data website at https://www.epa.gov/air-emissions-inventories/2008-national-emissions-inventory-nei-data (visited on April 20, 2016).

[5] US Census Bureau, American Fact Finder database for Matagorda County, Texas at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2015_PEPANNRES&prodType=table (viewed on April 20, 2016).

Mayor, Niki Coats
Mayor Pro-Tem, Carolyn McWaters
City Council
Mike Penry
Otis Cohn
James Franklin
Delores Terry

CITY OF CLEVELAND

907 E. Houston Ave
Cleveland, Texas 77327
Phone (281) 592-2667
Fax (281) 592-6624

Kelly McDonald, City Manager
Angela Smith, City Secretary

April 14, 2016

Texas Commission on Environmental Quality
Office of Air
Steve Hagle – Deputy Director
P. O. Box 13087
Austin, TX 78711-3087

Dear Mr. Hagle:

The City of Cleveland, Liberty County, Texas is responding to TCEQ's Air Quality Division request for solicitation of public comment on potential area designations and boundaries recommendations under the 2015 Ozone National Ambient Air Quality Standards (NAAQS).

Since 1997, the City of Cleveland, Texas and Liberty County, Texas have been included in the eight-hour Non-Attainment Ozone designated zone and map, as attached. In 2008, The TCEQ published the Rationale for Decision Matrix 2008 Eight-Hour Ozone Standard of 0.075 parts per million (or 75 parts per billion) Boundary and Designation Determination Recommendation by Air Quality Planning Area, of which EPA March 28, 2000 guidance memorandum recommends the default boundary be the MSA for areas with violating monitors, and provides criteria that states can look at to make different recommendations.

The City of Cleveland, Texas is designated non-attainment for the 2008 ozone standard with no monitors or are not monitoring above 70 ppb reportable to the EPA per the February 29, 2016 map attached.

Information and data supporting as non-attainment to designate all of Liberty County, Texas is outside the county and based upon suppositions at the time and may not, or do not, reflect actual physical data.

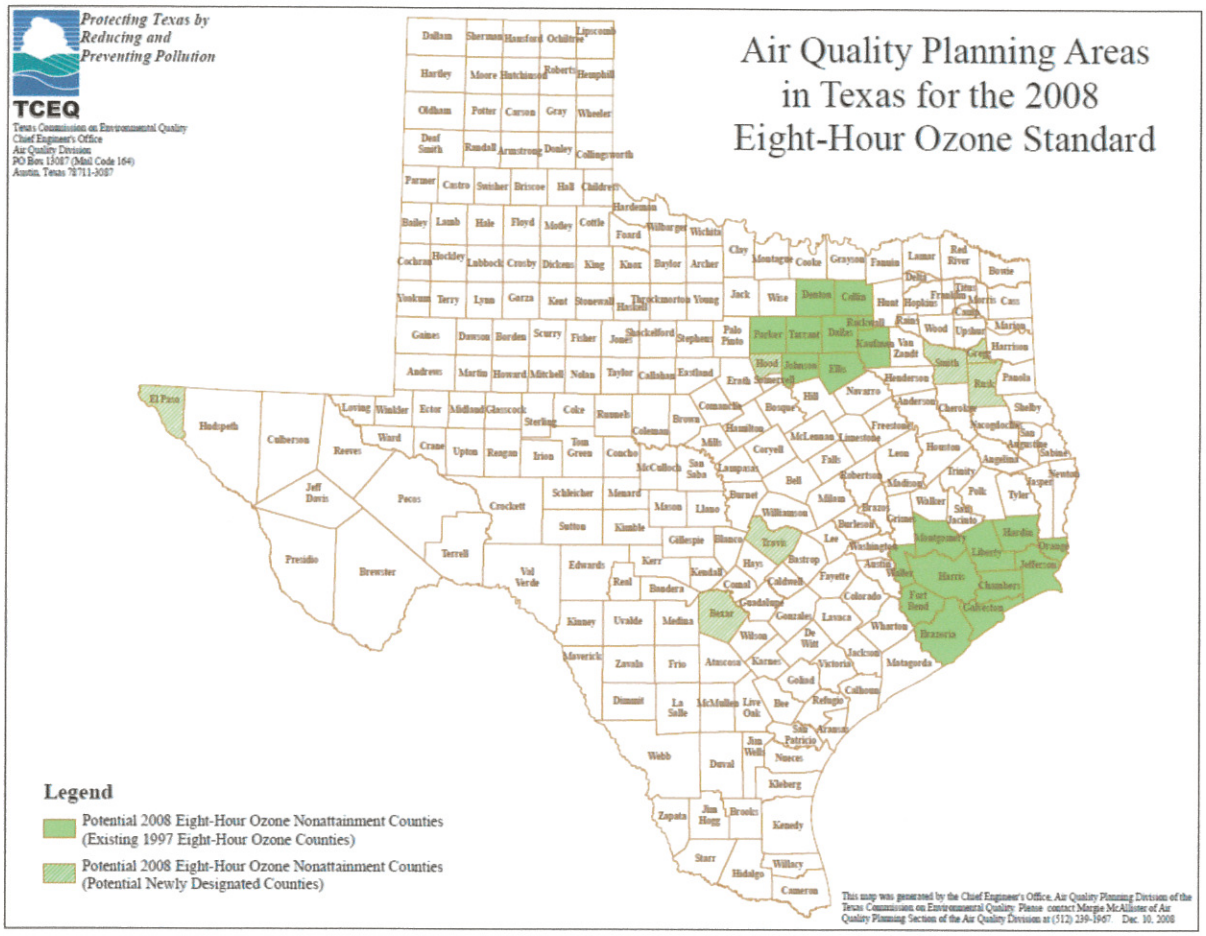
It is requested that the City of Cleveland, Texas, and Liberty County, Texas, be designated as an Attainment Zone for Air Quality until such time that physical monitoring evidence is presented to the TCEQ Office of Air proving that the city/county is not compliant with the 70 ppb requirements.

Sincerely,

Kelly McDonald

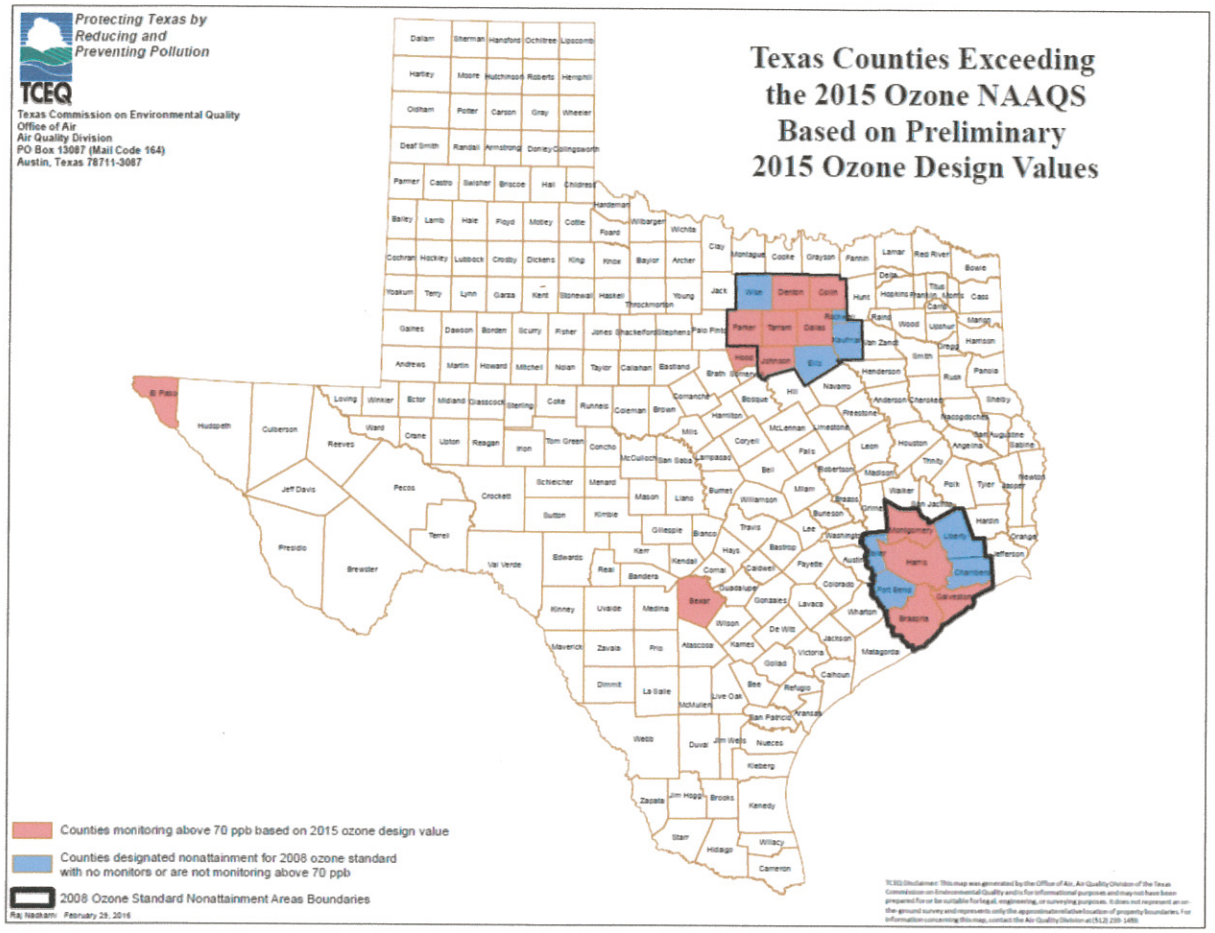
Kelly McDonald, CPM, CMC
City Manager

2008 TCEQ Map – Legend 1997



February 29, 2016 Map

Counties In Blue With No Monitors Or Are Not Monitoring Above 70 ppb

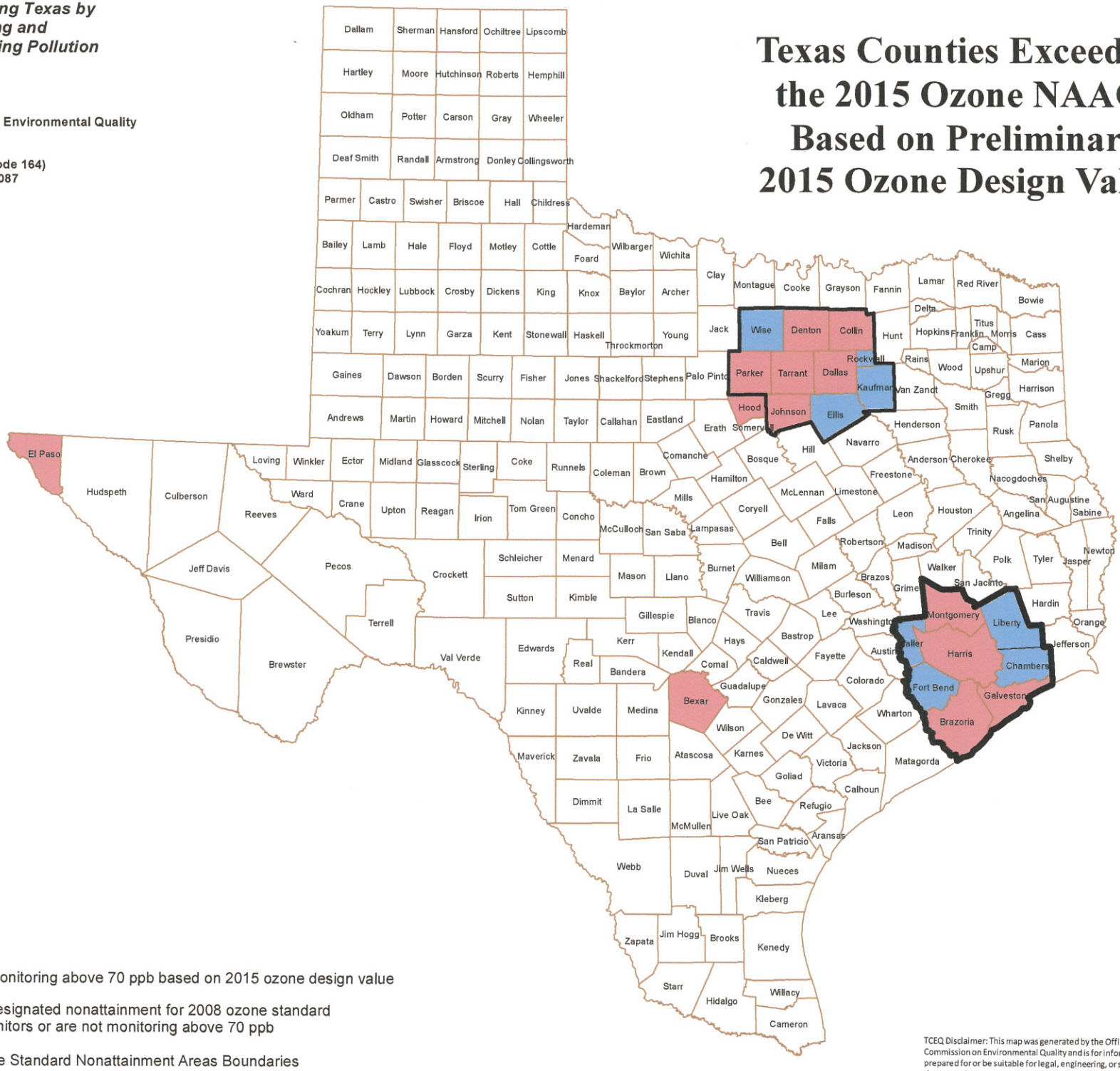


Protecting Texas by Reducing and Preventing Pollution

TCEQ

Texas Commission on Environmental Quality
Office of Air
Air Quality Division
PO Box 13087 (Mail Code 164)
Austin, Texas 78711-3087

Texas Counties Exceeding the 2015 Ozone NAAQS Based on Preliminary 2015 Ozone Design Values



Counties monitoring above 70 ppb based on 2015 ozone design value

Counties designated nonattainment for 2008 ozone standard with no monitors or are not monitoring above 70 ppb

2008 Ozone Standard Nonattainment Areas Boundaries

Raj Nadkarni February 29, 2016

TCEQ Disclaimer: This map was generated by the Office of Air, Air Quality Division of the Texas Commission on Environmental Quality and is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For information concerning this map, contact the Air Quality Division at (512) 239-1459.

DYNAMIC
DAYTON
TEXAS

April 12, 2016

Texas Commission on Environmental Quality
Office of Air
Steve Hagle – Deputy Director
P.O. Box 13087
Austin, TX 78711-3087

The City of Dayton, Texas and Liberty County is responding to TCEQ's Air Quality Division request for solicitation of public comment on potential area designations and boundaries recommendations under the 2015 ozone National Ambient Air Quality Standards (NAAQS).

Since 1997 Liberty County has been included in the 8 Hour Non-Attainment Ozone designated zone and map. (See attached 2008 TCEQ Map – Legend 1997).

In 2008 the TCEQ published the Rationale for Decision Matrix 2008 Eight-Hour Ozone Standard of 0.075 parts per million (or 75 parts per billion) Boundary and Designation Determination Recommendation by Air Quality Planning Area (Revised 12/10/08). Of which EPA March 28, 2000, guidance memorandum recommends the default boundary be the MSA for areas with violating monitors, and provides criteria states can look at to make different recommendations.

The City of Dayton, Texas and Liberty County is designated nonattainment for 2008 ozone standard with no monitors or are not monitoring above 70 ppb reportable to the EPA per the Attached Map from TCEQ below (February 29, 2016 Map).

Information and data supporting as non-attainment to designate all of Liberty County is outside the county and based upon suppositions at the time and may not reflect actual physical data.

The Dayton Community Development Corporation is requesting that the City of Dayton, Texas and Liberty County be designated as an Attainment Zone for Air Quality until such time that physical monitoring evidence is presented to the TCEQ Office of Air proving we are not compliant with the 70 PPB requirements.

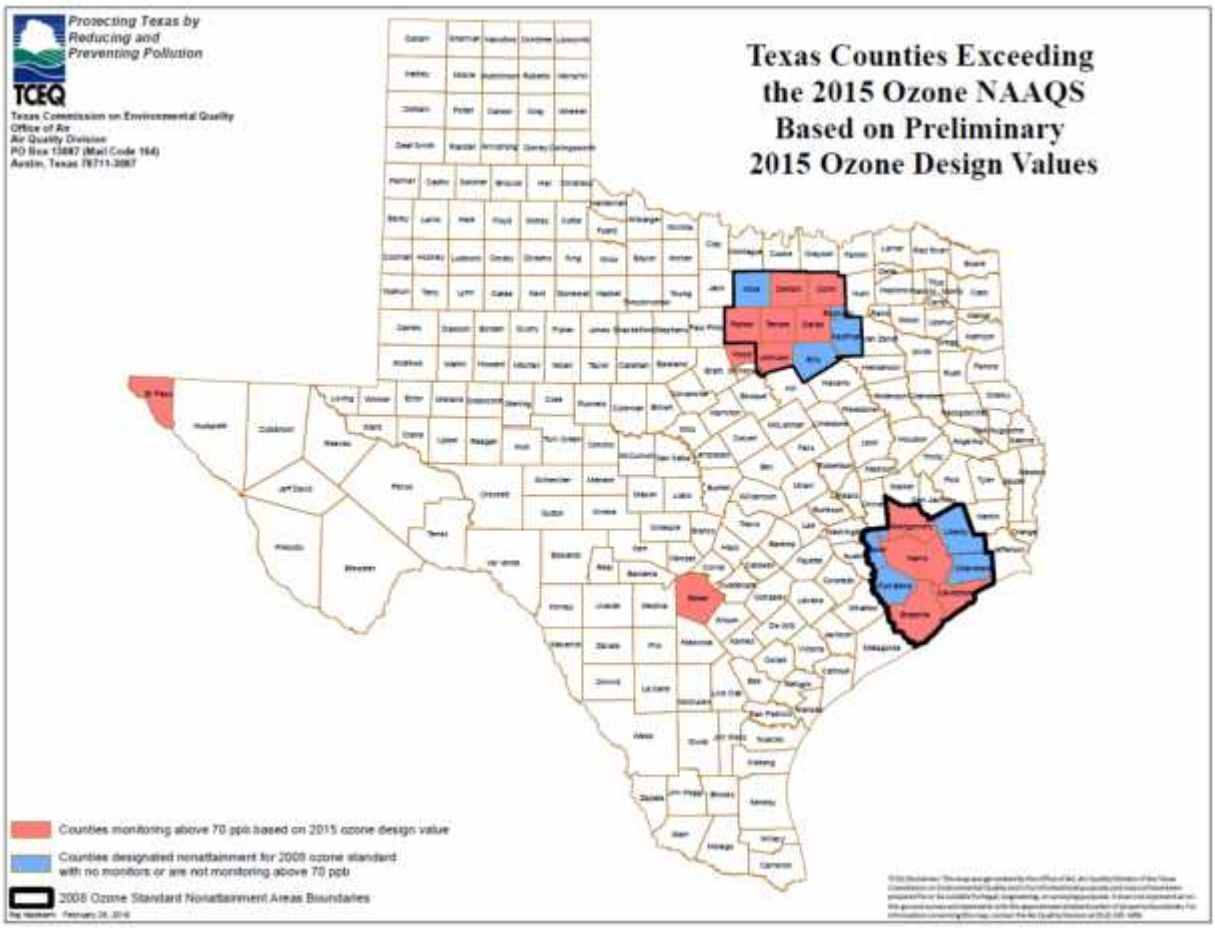
Thank you,

Wendell Null
Dayton Community Development Corporation, President

Dayton Community Development Corporation
801 S. Cleveland, Suite B ~ Dayton, Texas 77535 ~ 936.257.0055 ~ fax 936.257.0066
www.daytontx.com

2008 TCEQ Map – Legend 1997

February 29, 2016 Map
Counties In Blue With No Monitors Or Are Not Monitoring Above 70 ppb



March 31, 2016

Texas Commission on Environmental Quality
Office of Air
Steve Hagle – Deputy Director
P.O. Box 13087
Austin, TX 78711-3087

Liberty County is responding to TCEQ's Air Quality Division request for solicitation of public comment on potential area designations and boundaries recommendations under the 2015 ozone National Ambient Air Quality Standards (NAAQS).

Since 1997 Liberty County has been included in the 8 Hour Non-Attainment Ozone designated zone and map. (See attached 2008 TCEQ Map – Legend 1997).

In 2008 the TCEQ published the Rationale for Decision Matrix 2008 Eight-Hour Ozone Standard of 0.075 parts per million (or 75 parts per billion) Boundary and Designation Determination Recommendation by Air Quality Planning Area (Revised 12/10/08). Of which EPA March 28, 2000, guidance memorandum recommends the default boundary be the MSA for areas with violating monitors, and provides criteria states can look at to make different recommendations.

Liberty County is designated nonattainment for 2008 ozone standard with no monitors or are not monitoring above 70 ppb reportable to the EPA per the Attached Map from TCEQ below (February 29, 2016 Map).

Information and data supporting as non-attainment to designate all of Liberty County is outside the county and based upon suppositions at the time and may not reflect actual physical data.

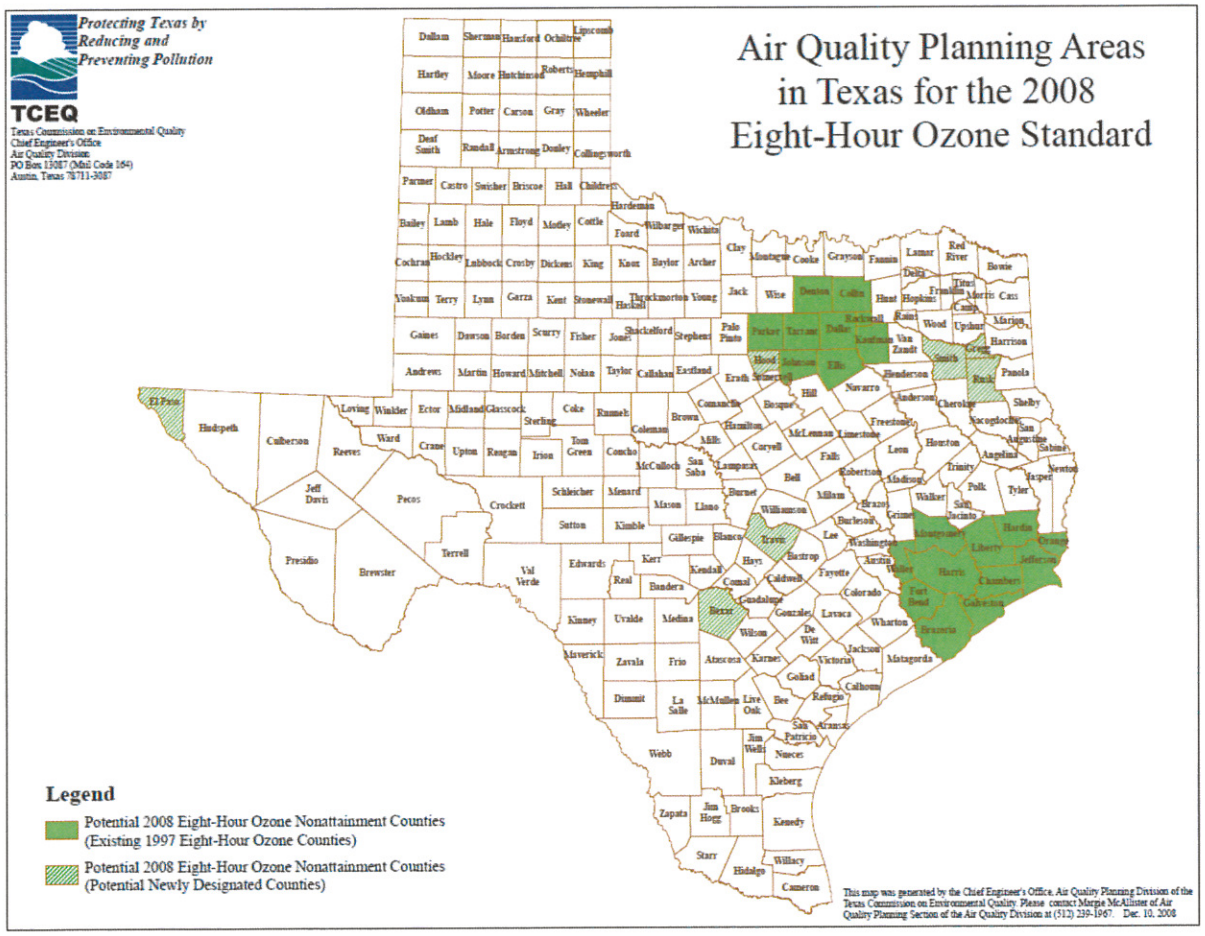
The City of Liberty is requesting that the City of Liberty be designated as an Attainment Zone for Air Quality until such time that physical monitoring evidence is presented to the TCEQ Office of Air proving we are not compliant with the 70 PPB requirements.

Sincerely,

Gary Broz
City Manager

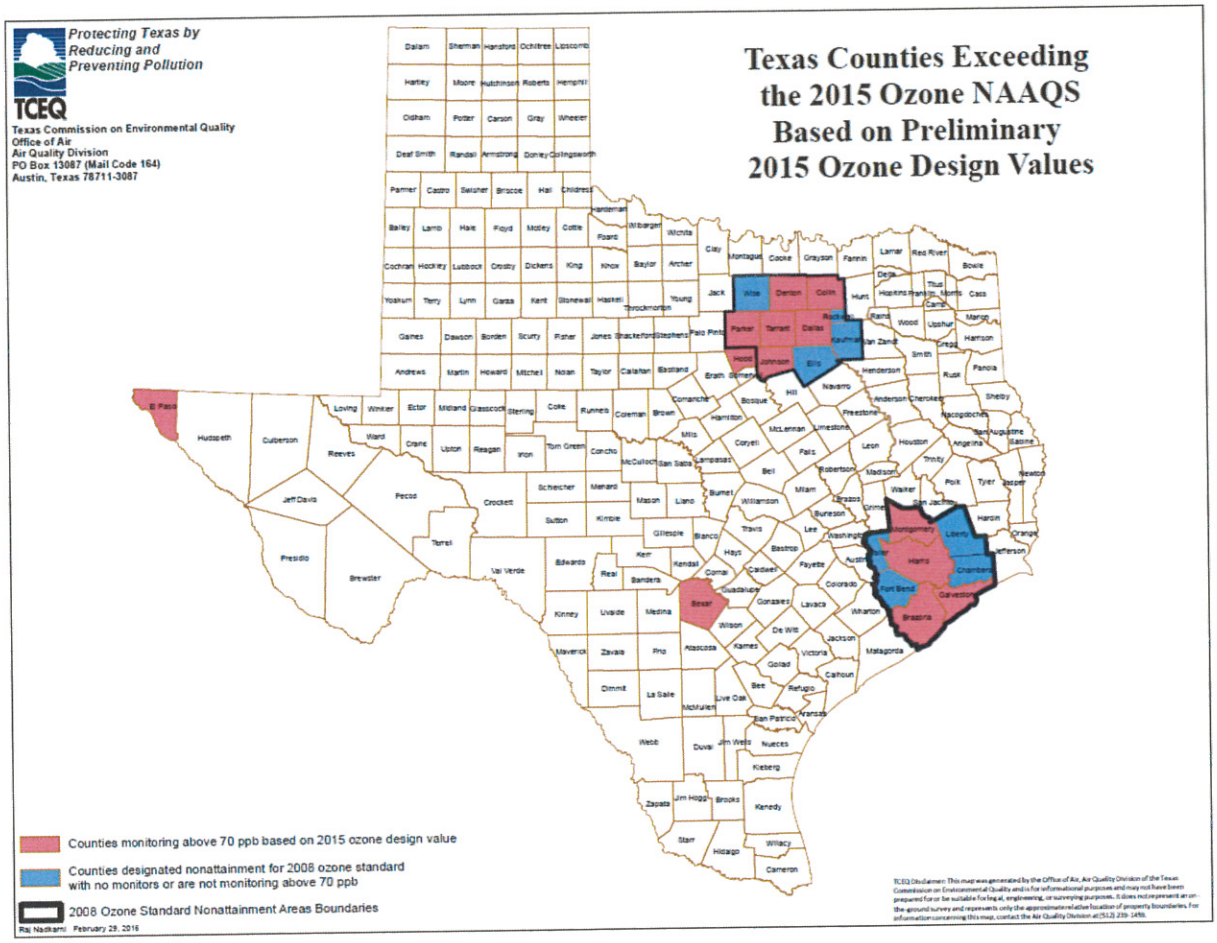
1829 Sam Houston Street Liberty, Texas 77575 936-336-3684 Fax: 936-336-9846 www.cityofliberty.org

2008 TCEQ Map – Legend 1997



February 29, 2016 Map

Counties In Blue With No Monitors Or Are Not Monitoring Above 70 ppb



JAY KNIGHT
COUNTY JUDGE

THE COUNTY OF LIBERTY

Est. 1836

1923 SAM HOUSTON
LIBERTY, TEXAS 77575

AIR PERMITS DIVISION
APR 18 2016
RECEIVED

April 14, 2016

Texas Commission on Environmental Quality
Office of Air
Steve Hagle – Deputy Director
P.O. Box 13087
Austin, TX 78711-3087

Liberty County is responding to TCEQ's Air Quality Division request for solicitation of public comment on potential area designations and boundaries recommendations under the 2015 ozone National Ambient Air Quality Standards (NAAQS).

Since 1997 Liberty County has been included in the 8 Hour Non-Attainment Ozone designated zone and map. (See attached 2008 TCEQ Map – Legend 1997).

In 2008 the TCEQ published the Rationale for Decision Matrix 2008 Eight-Hour Ozone Standard of 0.075 parts per million (or 75 parts per billion) Boundary and Designation Determination Recommendation by Air Quality Planning Area (Revised 12/10/08). Of which EPA March 28, 2000, guidance memorandum recommends the default boundary be the MSA for areas with violating monitors, and provides criteria states can look at to make different recommendations.

Liberty County is designated nonattainment for 2008 ozone standard with no monitors or are not monitoring above 70 ppb reportable to the EPA per the Attached Map from TCEQ below (February 29, 2016 Map).

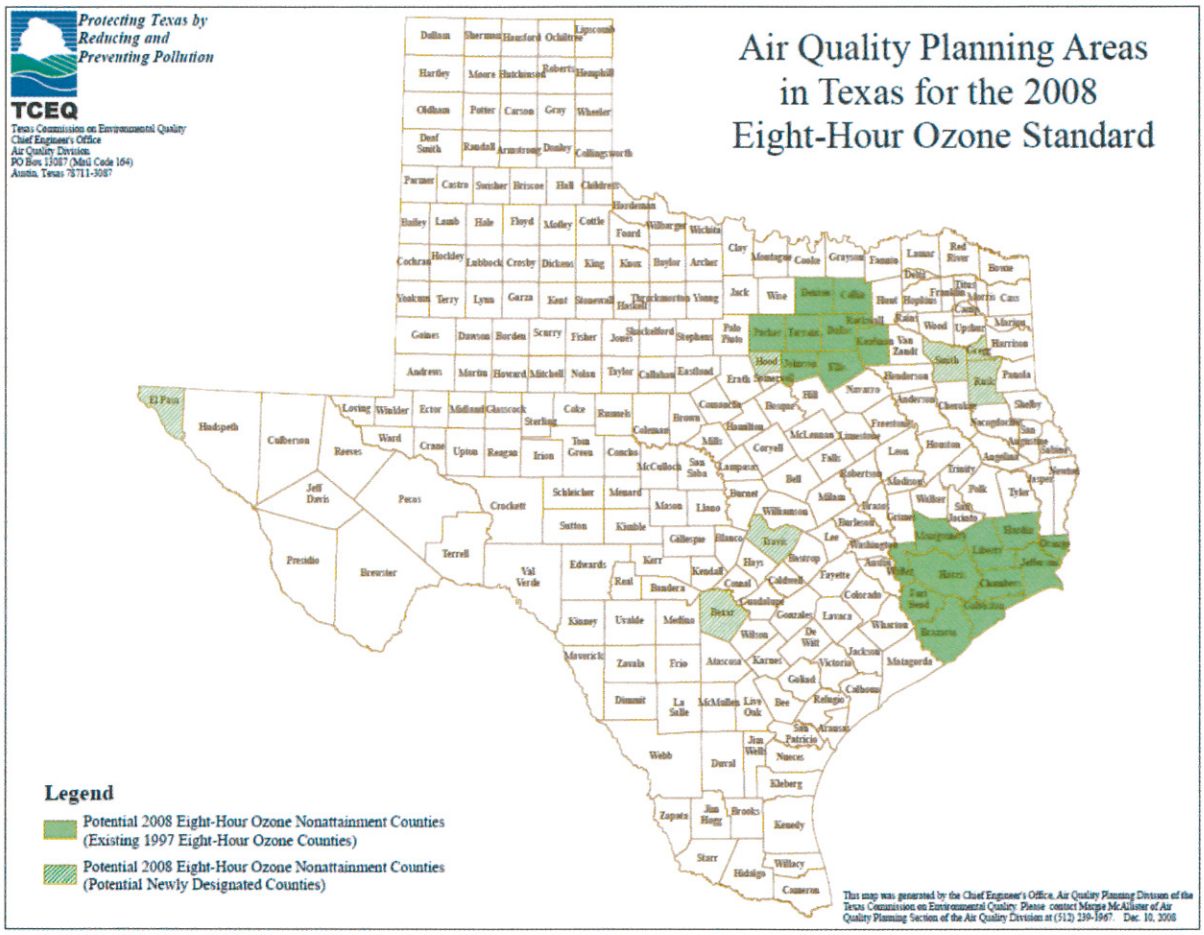
Information and data supporting as non-attainment to designate all of Liberty County is outside the county and based upon suppositions at the time and may not reflect actual physical data.

Liberty County is requesting that Liberty County be designated as an Attainment Zone for Air Quality until such time that physical monitoring evidence is presented to the TCEQ Office of Air proving we are not compliant with the 70 PPB requirements.

Sincerely,
Jay Knight
Liberty County Judge

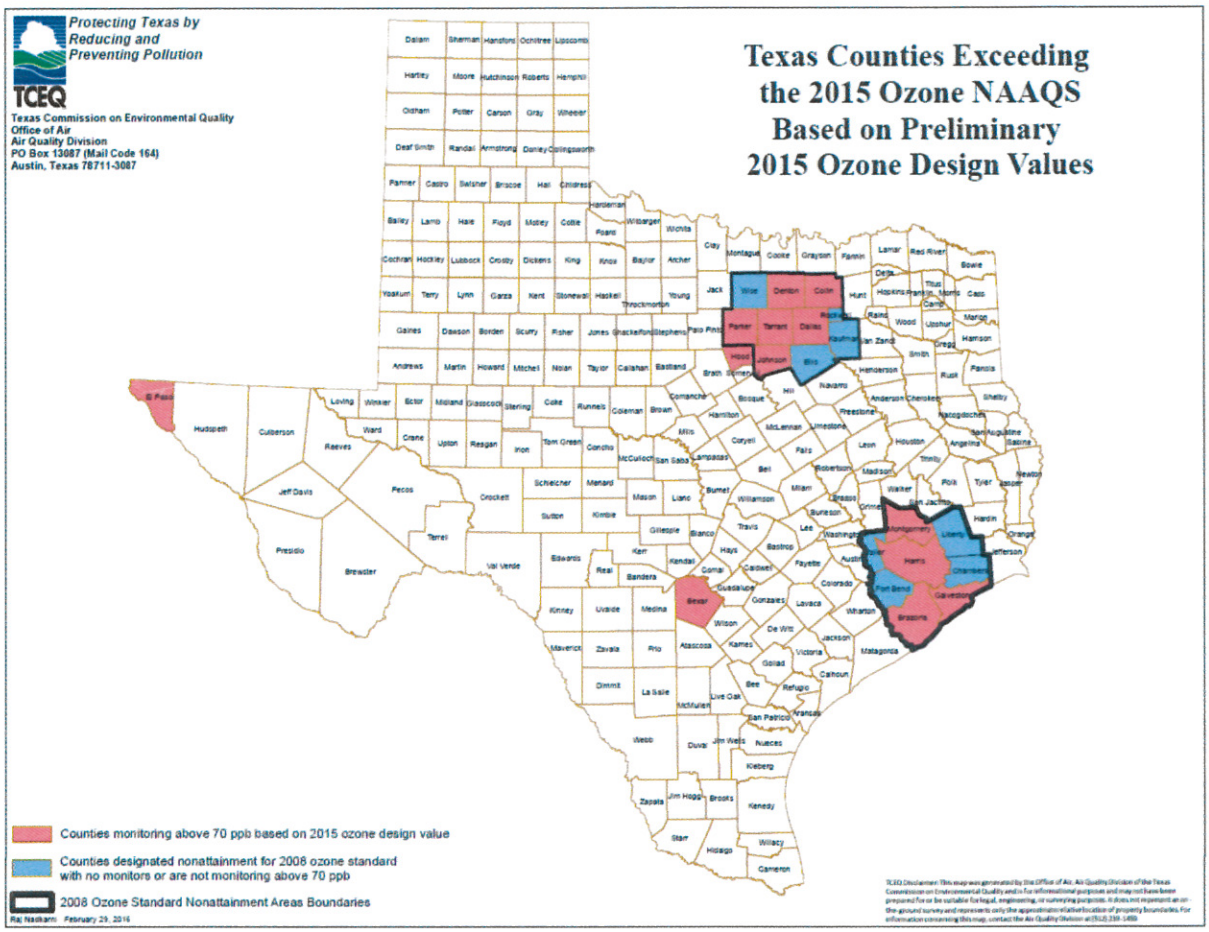
936/336-4665 jay.knight@co.liberty.tx.us FAX: 936/336-4518

2008 TCEQ Map – Legend 1997



February 29, 2016 Map

Counties In Blue With No Monitors Or Are Not Monitoring Above 70 ppb



TEXAS CHEMICAL COUNCIL
1402 Nueces Street • Austin, Texas 78701-1586 • (512) 646-6400 • Fax (512) 646-6420

April 15, 2016

Ms. Kristin Patton
State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality
MC 206
P.O. Box 13087
Austin, TX 78711-3087

Via electronic submission to Kristin.patton@tceq.texas.gov

RE: *Non-Rule Project No. 2016-009-SIP-NR; 2015 Ozone NAAQS Designation Recommendations*

Dear Ms. Patton:

The Texas Chemical Council ("TCC") appreciates the opportunity to submit these comments on the above-referenced Texas Commission on Environmental Quality (TCEQ) Air Quality Division's proposed State Designation Recommendations for the 2015 Eight-Hour Ozone National Ambient Air Quality Standards ("NAAQS").

TCC is a statewide trade association representing over 70 chemical manufacturers operating approximately 200 Texas facilities, the great majority of which are located in the Houston-Galveston-Brazoria (HGB) nonattainment area. TCC member companies manufacture products that improve the quality of life for all Texans. The Texas chemical industry has more than $75 billion in physical assets in the state and pays over $1 billion annually in state and local taxes. TCC's members provide approximately 70,000 direct jobs and over 450,000 indirect jobs to Texans across the state.

We respectfully offer the following comments to the proposed area designation recommendations:

- TCC agrees that monitoring data are the most accurate and reliable source of evidence, and that the data should be used whenever available to determine attainment / nonattainment status. TCC further agrees with using the most current monitoring data possible (2013 to 2015) to designate attainment / nonattainment status.

- TCC is also in agreement with TCEQ that all counties that do not have a regulatory monitor should be designated as unclassifiable/attainment.

- Referring to the map "Texas Counties Exceeding the 2015 Ozone NAAQS – Based on Preliminary 2015 Ozone Design Values," the blue–highlighted counties are "Counties designated nonattainment for 2008 ozone standard with no monitors or are not monitoring above 70 ppb." These counties should only be treated as nonattainment for the 2015 Ozone NAAQS if a current analysis of the preponderance of evidence indicates that they should be included in nonattainment areas. It is not appropriate to simply carry forward an analysis that was developed in order to designate the county for a previous ozone standard. The analysis should be updated to determine which designation is supported by the current evidence.

- TCC believes that all regulatory tools allowed in the Clean Air Act such as Exceptional Events and §179(b) International Emissions demonstrations should be utilized by Texas for submittal to EPA because there is not an ability to control emissions from these events by sources within the state.

TCC would like to emphasize the fact that air quality in Texas is vastly improving due to innovative emission reduction strategies implemented through collaboration between TCEQ and industry. TCC expects that the maximum further progress in ozone reduction will come through continued collaboration between TCEQ and industry. The Texas programs have proven effective in reducing overall emissions and improving the overall environment despite significant growth in population and vehicles miles traveled, as evidenced by the following:

- From 2014-2017, the total HRVOC allowances cap is being reduced incrementally to achieve the 25% total reduction by calendar year 2017.

- The innovative components of the successful NOx, volatile organic compounds (VOCs), and highly reactive volatile organic compounds (HRVOCs) reduction programs applicable to industry in the HGB nonattainment area have achieved 27% ozone reduction since 2001 and contain the following components:
    - Continuous emissions monitoring for NOx point sources;
    - Voluntary efforts to reduce the frequency and magnitude of upset emissions;
    - Lowering HRVOC reportable quantities;
    - HRVOC flare, cooling tower, vent gas stream and safety valve continuous monitoring;
    - HRVOC hourly emission limit program;
    - HRVOC annual emission cap and trade program;
    - Internal and external floating roof design requirements and operational restrictions;
    - Enhanced degassing of storage tank restrictions;
    - TCEQ's Air Pollution Watch List program; and
    - Voluntary use of newly commercial VOC gas imaging technology.

- In the HGB nonattainment area, TCC member companies have worked with other industrial sectors to invest nearly $10 billion since 2001 to achieve an 80 percent reduction of nitrogen oxides from point sources.

TCC appreciates the opportunity to comment on TCEQ's Air Quality Division's State Designation Recommendations for the 2015 Ozone NAAQS. If you have any questions or need additional information, please do not hesitate to contact me at (512) 413-6196 or Landwehr@texaschemistry.org.

Yours respectfully,

Martha K. Landwehr
General Counsel

Air Improvement Resources Committee

8700 Tesoro Drive, Suite 700, San Antonio, Texas 78217 p: (210) 362-5200 f: (210) 225-5937

Hon. Ron Nirenberg
Chair,
AIR Executive Committee
City of San Antonio,
Councilman

Hon. Chris Riley
Vice-Chair,
AIR Executive Committee
Alamo Area MPO,
City of Leon Valley,
Mayor

Hon. Richard L. Jackson
Wilson County,
Judge

Hon. Sherman Krause
Comal County,
Judge

Hon. Nelson Wolff
Bexar County,
Judge

Hon. Robert L. Hurley
Atascosa County,
Judge

Hon. John H. Williams
Greater Bexar County
Council of Cities,
Universal City,
Mayor

Hon. Mike Fincke
AACOG Board of Directors,
Kendall County,
Commissioner

Hon. Darrel L. Lux
Kendall County,
Judge

Hon. Jim Wolverton
Guadalupe County
Commissioner

Hon. Wayne Peters
City of New Braunfels,
Councilman

March 23, 2016

Kristin Patton
MC 206, State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087
Austin, Texas 78711-3087

Re: Comments to State Designation Boundary Recommendations to the EPA for the 2015 Ozone NAAQS

Dear Ms. Patton:

The Air Improvement Resources (AIR) Executive Committee of the San Antonio-New Braunfels Metropolitan Statistical Area (MSA) appreciates the opportunity to comment on the TCEQ's designation recommendations to the Environmental Protection Agency (EPA) for the 2015 Ozone NAAQS. The AIR Executive Committee is a committee of elected officials representing local governments in the eight-county San Antonio-New Braunfels MSA, which includes Atascosa, Bandera, Bexar, Comal, Guadalupe, Kendall, Medina, and Wilson counties. The AIR Executive Committee is responsible for the development and implementation of the region's voluntary ozone control plan.

The TCEQ has recommended a nonattainment designation for Bexar County. TCEQ's nonattainment recommendations are based on regulatory monitors measuring over the 2015 ozone NAAQS of 70 parts per billion (ppb) for the period between 2013 and 2015. The AIR Executive Committee would like to advocate that TCEQ consider changing the premise for their recommendation and instead recommend an "unclassifiable" designation for three reasons, which are explained in more detail in the enclosure:

- The EPA plans to make final designation values based on the 2014 to 2016 certified air quality data, and the San Antonio-New Braunfels MSA is actively pursuing additional control strategies that are expected to impact 2016 ozone levels.
- The MSA's ozone levels are greatly influenced by transport from other Texas regions and beyond.
- The MSA's ozone observations are within a level of measurement uncertainty that could result in a design value that meets the 2015 ozone NAAQS for the 3-year average between 2014 and 2016, the period for which the EPA plans to base nonattainment designations.

For these reasons, we feel there is not sufficient information to support a designation of "nonattainment" and ask TCEQ to reconsider their recommendation to the EPA from "nonattainment" to an "unclassifiable."

Signed,

Councilman Ron Nirenberg, City of San Antonio, Chair, AIR Executive Committee

Mayor Chris Riley, City of Leon Valley Vice-Chair, AIR Executive Committee

Enclosure: Additional Detail in Support of Comments to State Designation Boundary Recommendations to the EPA for the 2015 Ozone NAAQS

cc: Office of the Governor, P.O. Box 12428, Austin, TX 78711

Additional Detail in Support of Comments to State Designation Boundary Recommendations to the EPA for the 2015 Ozone NAAQS

The EPA plans to make final designation values based on the 2014 to 2016 certified air quality data, and the San Antonio-New Braunfels MSA is actively pursuing additional control strategies that are expected to impact 2016 ozone levels.

The members of the AIR Committee for the San Antonio-New Braunfels region is actively pursuing control strategies as a member of the Ozone Advance Program and through a recent initiative adopted in 2015, Air Quality Strategic Plan for the Alamo Region, that is directly aimed at developing air quality control strategies to achieve attainment. The AIR Committee feels this active push could positively impact the 2016 value used to calculate the 2014-2016 design value for which the EPA is using to determine designations.

The AIR Committee has taken a two-step approach to developing recommended control strategies suitable for counties, cities and private businesses. The Committee has already recommended "low-cost, effective control measures" that are primarily focused on reducing NO_X emissions (since photochemical modeling for the AACOG region has historically shown that reducing NO_X emissions most effectively reduces the formation of ground-level ozone). The Committee is now working on modeling further controls to formulate a second control measure recommendation list that will likely reflect "higher-cost, effective control measures." Some of the measures include:

- Open Burning Restrictions
- Small Source Reporting Requirements
- Clean Contracting Policies: Landscape and Construction Contracts
- Housing Regulations to Reduce Electricity Consumption
- Regulating Use of Unpermitted Combustion Equipment (such as restriction on backup generators, or testing generators during high ozone days)
- Lawnmower Replacement Program
- Emission Reduction Certificate (e.g. Austin Green Business Leaders, CTRMA Green Credits Program, Clean Air Partners Program)
- Promote the use of Commute Solutions Rideshare Program (NuRide)
- Promote use of VIA's Transit Services (work-hour credits for use of WiFi to do work-related tasks aboard the bus, employer subsidized transit, flex schedules to adjust to bus schedules, connect bike paths to transit and park and ride centers, incentivize the use of VIA's vanpool program)
- On-board Idle Reduction Technologies for Heavy-Duty Vehicles (HDV) (Auxiliary Power Unit – APU and Automatic Shut-off)
- Promote School Curricula and Education Programs

Also included are the following controls for which the City of San Antonio is considering:

- VOC Content Limits for Architectural, Traffic, and Industrial Maintenance Coatings
- Emission Specifications in Contracts

- City-owned Construction Equipment Replacement Program (replace Tier 0, Tier 1, and Tier 2 with Tier 4)
- Diesel Retrofits and Engine Rebuilds for City-owned Construction Equipment (retrofit Tier 0, 1, 2 w/ SCR)
- Alternative Fuels - CNG/LPG for city owned fleet
- Airport Terminal Gate Electrification
- Restrict Long-Term Idling
- Commuter Trip Reduction Programs (vanpool, carpool)
- Improved Non-Motorized Travel (Pedestrian/Bike)
- Electrification of City-owned Vehicle Fleet

The MSA's ozone levels are greatly influenced by transport from other Texas regions and beyond.

Transport is a contributing factor to background ozone levels impacting local regulatory monitors. The role of interstate, intrastate, and international transport should be considered in a nonattainment recommendation for any county. Transport outside of the San Antonio-New Braunfels MSA accounts for 68% of the peak 1-hour ozone recorded at the highest monitor in the San Antonio Region on days greater than 70 ppb.[1] Bexar County cannot enact reduction strategies which act beyond the local jurisdiction. Further, there is insufficient data to isolate sources in adjacent counties because there are no monitors located in the counties adjacent to Bexar County.

The MSA's ozone observations are within a level of measurement uncertainty that could result in a design value that meets the 2015 ozone NAAQS for the 3-year average between 2014 and 2016, the period for which the EPA plans to base nonattainment designations.

TCEQ should also consider in their recommendation the uncertainly of ozone observations. Due to monitoring uncertainty, TCEQ should allow +/- 15% ppb variance in the calculated design value used to determine attainment, since the EPA allows +/- 15% error in data accuracy for approving the calibrations of ozone monitors. Given the efforts taken in the region to implement control strategies and readings from other regulatory monitors in the county, the AIR Committee feels there a reasonable chance Bexar County could meet this goal.

[1] AACOG, Oct. 2015. "Ozone Analysis: June 2006 Photochemical Modeling Episode". prepared for the Alamo Area MPO. San Antonio, Texas. page 5-5. Available online: http://www.aacog.com/DocumentCenter/View/34698 . Accessed 03/21/2016.

From: [redacted]
To: Kristin Patton
Subject: 2015 Ozone NAAQS Designation Recommendations
Date: Thursday, April 14, 2016 10:33:45 PM

Kristin Patton, MC 206, State Implementation Plan Team
Office of Air, Texas Commission on Environmental Quality
P.O. Box 13087, Austin, Texas 78711-3087
kristin.patton@tceq.texas.gov

Re: "2015 Ozone NAAQS Designation Recommendations."

Dear Ms. Patton:

I write as Chair of the local Alamo Group of the Sierra Club in San Antonio, Texas. Local Sierrans strongly support new EPA ozone rules, which will make an important contribution to improving our health. We hope these rules will be lowered in the near future to a more medically justifiable 65 ppb. We also support EPA establishing limits on methane pollution from the oil and gas industry--pollution that poses a far greater threat than we previously thought.

For us here in South Texas it is especially critical that these methane rules include existing infrastructure. The oil and gas operations already existing in the Eagle Ford shale formation are causing serious damage to our health and air, exacerbating our ozone levels on many days of southeasterly winds.

We urge TCEQ and AACOG to work diligently for full implementation of these ozone (and methane) rules. It is past time for resistance and denial. It is time to begin serious implementation of the kinds of rules that will stop and reverse the continuing decline of our air quality. Rules that limit emissions from vehicles, cement and other industrial facilities, power plants, construction projects and the Eagle Ford are all needed. Even though Bexar County is the one area in South Texas officially in non-compliance now, our problems are regional, with significant contributions downwind from Eagle Ford and from North Texas down the IH-35 corridor as well. We need regional rules to solve our problems, and TCEQ has the authority and responsibility to create such rules for the improvement of our health, as well as our agriculture. These rules will not stifle industry, as they are becoming commonplace nationally.

They will help us here in South Texas, improving our health and air quality. They are needed now. The benefits will far outweigh the costs.

Sincerely,

Terry Burns, M.D.
Chair, Executive Committee
Alamo Group, Lone Star Chapter, Sierra Club
[redacted]

April 14, 2016

via email kristin.patton@tceq.texas.gov

Ms. Kristin Patton
Texas Commission on Environmental Quality
State Implementation Plan Team, MC-206
Office of Air
PO Box 13087
Austin, TX 78711-3087

Re: 2015 Ozone NAAQS Designation Recommendations

Ms. Patton:

CEMEX Construction Materials South, LLC appreciates the opportunity to comment on the TCEQ's designation recommendations to the EPA for the 2015 Ozone NAAQS. We operate in Comal County, which is part of the eight-county San Antonio-New Braunfels Metropolitan Statistical Area (MSA).

The TCEQ's Air Quality Division (AQD) is considering recommending that only counties with regulatory ozone monitors measuring over the 2015 ozone NAAQS of 70 parts per billion (ppb), based on the 2015 design value, be designated nonattainment. Consequently, the only county in the San Antonio-New Braunfels MSA that would be recommended as designated nonattainment would be Bexar County.

Comal County does not currently have any regulatory ozone monitors measuring over the 2015 ozone NAAQS. In addition, groups within the San Antonio-New Braunfels MSA are actively pursuing additional control strategies, through an Air Quality Strategic Plan adopted in 2015, that are expected to reduce 2016 ozone levels throughout the MSA. These strategies should benefit the entire MSA. Thus we support the AQD's decision to leave Comal County out of the nonattainment designation recommendations.

Please advise if you have any questions or need additional information.

Sincerely,

S. H. Sheth

Satish Sheth
Vice President – Environmental Affairs

CEMEX, Inc.
929 Gessner Road, Suite 1900, Houston, TX 77024 , (713) 973-5005

April 15, 2016

Kristin Patton
MC 206 State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087
Austin, Texas 78711-3087

Re: 2015 Ozone NAAQS Designation Recommendation

Dear Ms. Patton:

In response to your request for comment regarding TCEQ's State ozone designation recommendation released on March 15, 2015, the City of San Antonio and Bexar County are expressing our elevated concern related to the recommended designation of Bexar County as "non-attainment". We do not agree with your stated designation. In our opinion, the TCEQ has failed to conduct a comprehensive analysis referencing the U.S. EPA's five factors for non-attainment designation guidance issued to States on February 25, 2016.

The City of San Antonio and Bexar County are requesting TCEQ to complete its due diligence to consider non-attainment designation factors such as population density, traffic congestion, commercial development, industrial development, meteorological conditions, and pollution transport.

Attached to this letter are detailed comments regarding TCEQ's State ozone designation.

If you have any questions, please contact Douglas Melnick, City of San Antonio, Chief Sustainability Officer, at (210) 207-6103 or Andy Winter, Bexar County, Environmental Engineer, (210) 335-6700.

Sincerely,

Ivy R. Taylor
Mayor

Nelson W. Wolff
County Judge

Cc:
Councilman Ray Lopez, City of San Antonio District 6 & Chair of City Council Transportation, Technology and Utilities Committee
Councilman Ron Nirenberg, City of San Antonio District 8 & AACOG Air Improvement Resources Executive Committee Chair
Sheryl Sculley, City Manager, City of San Antonio

Attachment

Comments to 2015 Ozone NAAQS Designation Recommendation
For Bexar County
Prepared by the City of San Antonio & Bexar County

The City of San Antonio and Bexar County have been following federal and state activities related to implementation of the 2015 ozone standard, including EPA's guidance for area designations, released on February 25, 2016. The City of San Antonio and Bexar County are especially concerned about the appropriateness of the nonattainment area boundary recommendation proposed for Bexar County in the TCEQ ozone designation recommendation, dated March 15, 2016.

The recommendation by the TCEQ to only designate Bexar County as non-attainment may have adverse consequences for the City of San Antonio. The implications of these decisions for Bexar County and the City of San Antonio's air quality management are not acceptable, for reasons stated below:

The Clean Air Act Section 107(d)(1) defines a nonattainment area as *"any area that does not meet or any area that contributes to ambient air quality in a nearby area that does not meet the national ambient air quality standard"*. Therefore, TCEQ should consider factors such as population density, traffic congestion, commercial development, industrial development, meteorological conditions, and pollution transport.

The City of San Antonio and Bexar County are requesting TCEQ's full consideration of the following guiding principles as it finalizes designations. Referencing the EPA guidance issued to States on February 25, 2016, the following five criteria should serve as a framework for area specific analysis to support nonattainment area boundary recommendations:

1. air quality related data
2. emissions and emissions related data
3. meteorological data
4. geography/topography
5. jurisdictional boundaries

Office of City Attorney

April 11, 2016

Ms. Kristin Patton
MC207, State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Re: Comments to Sate Designation Boundary Recommendations to the EPA for the 2015 NAAQS.

Dear Ms. Patton:

Enclosed please find a Resolution 2016R-50, along with the attached more detailed comments, passed by the Seguin City Council on April 5, 2016.

The City of Seguin would like to stay actively involved in this process. Please address any correspondence to either the Mayor, or myself, at the address below.

Thank you for your consideration,

Sincerely,

Andrew Quittner
City Attorney

CITY HALL • 205 N. RIVER ST • SEGUIN, TEXAS 78155 • 830.401.2775 • FACSIMILE 830.401.2499
WWW.SEGUINTEXAS.GOV • E-MAIL: aquittner@seguintexas.gov

CITY OF SEGUIN RESOLUTION NO. 2016R-50

STATE OF TEXAS

A RESOLUTION OF THE CITY COUNCIL OF SEGUIN, TEXAS, APPROVING THE SUBMISSION OF COMMENTS TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY REGARDING THE STATE DESIGNATION BOUNDARY RECOMMENDATIONS TO THE ENVIRONMENTAL PROTECTION AGENCY FOR THE 2015 OZONE NATIONAL AMBIENT AIR QUALITY STANDARDS; AND DECLARING AN EFFECTIVE DATE

WHEREAS, the City of Seguin is presently considered as part of the San Antonio-New Braunfels Metropolitan Statistical Area (the "MSA"); and

WHEREAS, under the new National Ambient Air Quality Standards ("NAAQS") for ozone, states have until October 1, 2016 to submit a proposed state implementation plan to meet the new standards; and

WHEREAS, the Texas Commission on Environmental Quality is considering submitting Bexar County as nonattainment based on the three year period 2013-2015; and

WHEREAS, under the present operational standards if Bexar County is designated nonattainment the entire San Antonio MSA, including the City of Seguin, will, in all likelihood, be designated nonattainment and be subject to restrictions on economic development; and

WHEREAS, the ozone monitor in Seguin shows that for the 2013-2015 time period the City's 4th highest 8 hour average readings have been decreasing and meet both the current ozone standards and the standards set by the 2015 NAAQS; and

WHEREAS, with respect to Bexar County on high ozone days modeling has shown that the majority of the ozone comes from transport originating outside of Bexar County, if not outside of the State of Texas; and

WHEREAS, there is no evidence showing that Seguin significantly contributes to the high ozone days as measured in Bexar County; and

WHEREAS, the City of Seguin has been, and continues to be, an active participant in the Alamo Area Council of Government's Air Resource Committees; and

WHEREAS, the City of Seguin will continue to support efforts to decrease emissions that lead to ozone formation.

NOW THEREFORE BE IT RESOLVED by the City Council of Seguin, Texas:

PART 1. The City Council of Seguin Texas hereby adopts in full the recitals set forth above as part of this Resolution as if fully set forth herein.

PART 2. The City Council submits the following summary comments:

a. The City Council adopts the comments submitted by the Alamo Area Council of Government's Air Executive Committee.

b. According to data from TCEQ gathered from the Seguin Outdoor Learning Center (C506) monitor Seguin meets the 2015 NAAQS Ozone Standards. Further, the monitor data shows that Seguin has met the standards during the 2013-2015 time period. With this data, Guadalupe County, of which Seguin is the largest city, should be designated as Attainment rather than unclassified.

c. In order to protect the Seguin's best interests it is essential that monitoring at C506 located at the Seguin Outdoor Learning Center needs to continue during 2016, and beyond.

PART 3. The City Council approves of submitting this Resolution, along with the attached detailed comments, to the Texas Commission on Environmental Quality Office of Air for consideration with reference to the 2015 Ozone NAAQS Designation Recommendations.

PART 4. This Resolution is in full force and effect from and after the date of its passage.

PASSED AND ADOPTED this 5th day of April 2016.

DON KEIL
MAYOR

ATTEST:

Thalia Stautzenberger
City Secretary

THE CITY OF

Seguin

TEXAS

April 5, 2016

Kristin Patton
MC207, State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087
Austin, Texas 78711-3087

Re: Comments to State Designation Boundary Recommendations to the EPA for the 2015 NAAQS

Dear Ms. Patton:

The City of Seguin, Guadalupe County, Texas (Seguin), which is part of the San Antonio-New Braunfels Metropolitan Statistical Area (MSA), appreciates the opportunity to comment on the TCEQ's designation recommendation to the Environmental Protection Agency (EPA) for the 2015 Ozone NAAQS. The City of Seguin participates in the Alamo Area Council of Government's Air Resources Committee and generally agrees with, and joins in, the Comments submitted by the AIR Executive Committee. As part of the MSA Seguin comments separately because under the TCEQ's current designation of Nonattainment for Bexar County coupled with Unclassifiable/Attainment for Guadalupe County will, in all likelihood, result in the EPA designating the entire MSA, including Seguin, as Nonattainment.

Seguin agrees with the Air Executive Committee that, at this time, Bexar County should be designated as Unclassifiable/Attainment. To the extent that matters stated therein area applicable, Seguin adopts the reasoning set forth in the Air Executive Committee's Comment Letter as if fully set forth herein. Seguin is also willing to continue the consideration of additional control measures such as enacting and enforcing an anti-idling ordinance and insuring that no open burn permits are issued during high ozone season. Additionally, the City has been modernizing its fleet, instituted a bus route, and taken other measures to decrease its potential contribution of precursors to ozone formation.

The City also notes that high ozone days in Bexar County largely occur during meteorological conditions that greatly increase pollutants resulting from transport. This phenomena occurs primarily from areas outside the state of Texas (most notably from the Gulf of Mexico – and sources upwind therefrom).

Additionally, an ozone monitor is located at the Seguin Outdoor Learning Center (C506). Seguin has the largest municipal population located wholly in Guadalupe County. Based on the data obtained from that TCEQ monitor (see (last visited 3/29/2016): http://www.tceq.state.tx.us/cgi-bin/compliance/monops/8hr_4highest.pl), Guadalupe County should be designated at

"Attainment" rather than "Unclassifiable." In fact, looking at the available data for 2013-2015, Seguin's 4th highest 8 hour average, 69ppm occurred in 2013. The fourth highest average has decreased each year since that time, with a three year average of 65ppm. From this data it is clear that Seguin and, by extension, all of Guadalupe County meet the 2015 NAAQS for ozone supporting a designation of Attainment. Seguin respectfully requests that the TCEQ change the designation of Guadalupe County from Unclassifiable to Attainment.

Somewhat related to this matter, and a matter of great concern to Seguin, is that it appears that TCEQ has removed the Seguin Outdoor Learning Center (C506) from service, or for some reason unknown to Seguin no data is available for 2016. Seguin believes that it should have been formally notified of this change prior to its occurrence. Seguin also believes that this monitor is necessary, particularly with respect to any decisions by TCEQ or the EPA over the MSA that will be eventually covered by any designation of Nonattainment.

Lhoist North America
Lhoist Group

April 15, 2016 via email kristin.patton@tceq.texas.gov

Ms. Kristin Patton
Texas Commission on Environmental Quality
State Implementation Plan Team, MC-206
Office of Air
PO Box 13087
Austin, TX 78711-3087

Re: 2015 Ozone NAAQS Designation Recommendations

Ms. Patton:

Lhoist North America of Texas (Lhoist), previously known as Chemical Lime Company, appreciates the opportunity to comment on the TCEQ's designation recommendations to the EPA for the 2015 Ozone NAAQS. We operate in Comal County, which is part of the eight-county San Antonio-New Braunfels Metropolitan Statistical Area (MSA).

The TCEQ's Air Quality Division (AQD) is considering recommending that only counties with regulatory ozone monitors measuring over the 2015 ozone NAAQS of 70 parts per billion (ppb), based on the 2015 design value, be designated nonattainment. Consequently, the only county in the San Antonio-New Braunfels MSA that would be recommended as designated nonattainment would be Bexar County.

Comal County does not currently have any regulatory ozone monitors measuring over the 2015 ozone NAAQS. In addition, groups within the San Antonio-New Braunfels MSA are actively pursuing additional control strategies, through an Air Quality Strategic Plan adopted in 2015 that are expected to reduce 2016 ozone levels throughout the MSA. These strategies should benefit the entire MSA. Thus we support the AQD's decision to leave Comal County out of the nonattainment designation recommendations.

Please contact me at (817) 806-1458 if you have any questions or need additional information.

Sincerely,

Steven Curreri
Regional Environmental Manager
Lhoist North America, Inc.

P.O. Box 985004, Fort Worth, Texas 76185-5004
3700 Hulen Street, Fort Worth, Texas 76107
Phone: (817) 732-8164 (800) 365-6724

David Perkins
Vice President – Environmental, Government and Public Affairs
Cement and Southwest Divisions

April 15, 2016 via email **kristin.patton@tceq.texas.gov**

Ms. Kristin Patton
Texas Commission on Environmental Quality
State Implementation Plan Team, MC-206
Office of Air
PO Box 13087
Austin, TX 78711-3087

Re: 2015 Ozone NAAQS Designation Recommendations

Ms. Patton:

Martin Marietta appreciates the opportunity to comment on the TCEQ's designation recommendations to the EPA for the 2015 Ozone NAAQS. Through our wholly-owned subsidiaries we operate in Comal County, which is part of the eight-county San Antonio-New Braunfels Metropolitan Statistical Area (MSA).

The TCEQ's Air Quality Division (AQD) is considering recommending that only counties with regulatory ozone monitors measuring over the 2015 ozone NAAQS of 70 parts per billion (ppb), based on the 2015 design value, be designated nonattainment. Consequently, the only county in the San Antonio-New Braunfels MSA that would be recommended as designated nonattainment would be Bexar County.

Comal County does not currently have any regulatory ozone monitors measuring over the 2015 ozone NAAQS. In addition, groups within the San Antonio-New Braunfels MSA are actively pursuing additional control strategies, through an Air Quality Strategic Plan adopted in 2015, that are expected to reduce 2016 ozone levels throughout the MSA. These strategies should benefit the entire MSA. Thus we support the AQD's decision to leave Comal County out of the nonattainment designation recommendations.

Please contact me if you have any questions or need additional information.

Sincerely,

David Perkins
VP Environmental, Government and Public Affairs
Cement and Southwest Divisions

Cement and Southwest Divisions
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JOINT RESOLUTION OF THE ALAMO AREA COUNCIL OF GOVERNMENTS AIR IMPROVEMENT RESOURCES EXECUTIVE COMMITTEE AND THE CAPITAL AREA COUNCIL OF GOVERNMENTS CLEAN AIR COALITION ON THE 2015 OZONE NATIONAL AMBIENT AIR QUALITY STANDARDS DESIGNATIONS AND IMPLEMENTATION

WHEREAS, the Alamo Area Council of Governments (AACOG) Air Improvement Resources (AIR) Executive Committee and the Capital Area Council of Governments (CAPCOG) Clean Air Coalition (CAC) support approaches to implementing the Ozone National Ambient Air Quality Standards (NAAQS) that achieve clean air while minimizing economic and regulatory burdens on our regions;

WHEREAS, there can be serious regulatory and economic consequences for an area that is designated as "nonattainment" for an Ozone NAAQS that can last over 20 years even if the area is able to come back into attainment of the NAAQS quickly after its initial designation;

WHEREAS, the Clean Air Act (CAA) provides the U.S. Environmental Protection Agency (EPA) with the ability to designate an area as "unclassifiable" or to defer the initial designation for an area by up to 1 year if there is some uncertainty as to what an area's designation should be;

WHEREAS, any "nonattainment" designation made by EPA on October 1, 2017, based on an area's 2014-2016 design value would not account for 2017 Ozone data that may be low enough for the area's 2015-2017 design value to be in attainment of the NAAQS;

WHEREAS, the EPA used both "unclassifiable" designations and designation deferrals for the 2008 Ozone NAAQS and the 2012 Fine Particulate Matter ($PM_{2.5}$) NAAQS in recent years;

WHEREAS, the EPA only requires ozone measurements to be accurate within a range of +/- 7% in order to be considered valid;

WHEREAS, the success of the Early Action Compact process and other voluntary ozone planning efforts in the San Antonio and Austin areas over the past 14 years have shown that flexible approaches to attaining and maintaining the Ozone NAAQS can be successful, and that nonattainment designations are not always necessary to achieve those goals;

WHEREAS, interstate and intrastate ozone transport accounts for a significant share of the high ozone levels in many metro areas, including the San Antonio and Austin areas;

WHEREAS, Section 110 of the CAA provides the EPA with mechanisms to require emission reductions to ensure attainment and maintenance of the 2015 Ozone NAAQS outside of the designation process;

WHEREAS, the U.S. Supreme Court's ruling in *Whitman v. American Trucking Associations* in 2001 that Congress did not clearly intend for Title I, Part D, Subpart 2 of the CAA, to be used to implement an 8-hour Ozone NAAQS in a nonattainment area if the region's design value was less than 0.09 parts per million (ppm), rather than the more general provisions of Subpart 1 for nonattainment areas, and that there may be permissible interpretations of the CAA that would allow for the use of Subpart 1 to implement an Ozone NAAQS;

WHEREAS, implementation of the 2015 Ozone NAAQS under Subpart 2 can lead to inefficient ozone controls, including a number of mandatory volatile organic compounds that would not contribute significantly to reductions in peak ozone levels in the San Antonio or Austin areas;

WHEREAS, the EPA's stated intent to use Subpart 2 and the "percent above threshold" approach to implementing the 2015 Ozone NAAQS would result in many areas being designated nonattainment with a "Marginal" classification that would be unlikely to reach attainment of the 2015 Ozone NAAQS within three years of designation as required for Marginal nonattainment areas, thereby potentially delaying the planning work necessary to develop an attainment demonstration and putting controls in place for the area, and delaying attainment or interfering with maintenance of the NAAQS in downwind areas;

NOW, THEREFORE, BE IT RESOLVED BY AACOG'S AIR EXECUTIVE COMMITTEE AND CAPCOG'S CAC:

The EPA should only consider an area to be violating the 2015 Ozone NAAQS for the purposes of initial area designations if: 1) the 2014-2016 design value is above 75 ppb; and, 2) the 2016 4th highest daily maximum 8-hour ozone (MDA8) is also above 75 ppb;

In order to account for the possibility that an area's 2017 ozone levels may be low enough for the area to be designated "unclassifiable," the EPA should consider deferring an area's initial designation to 2018 if it: 1) is not currently designated nonattainment for an Ozone NAAQS; 2) does have a 2014-2016 ozone design value over 75 ppb; and, 3) has a 4th highest MDA8 in 2016 that is also over 75 ppb.

The EPA should limit the geographic extent of any new nonattainment areas to the smallest area possible, and rely on voluntary air quality planning efforts and other mechanisms in the CAA to reduce the contributions from nearby areas to any violations in the nonattainment area.

The EPA should only consider adding a county to a new nonattainment area based on modeled contributions to a violation of the 2015 Ozone NAAQS if the county's contribution exceeds the range that could be explained by measurement uncertainty.

The EPA should consider the air quality and economic benefits of making more extensive use of its authority under Section 110 of the CAA to address interstate and intrastate ozone impacts.

The EPA should consider implementing the air quality and economic benefits of implementing the 2015 Ozone NAAQS under "Subpart 1" rather than "Subpart 2" for all parts of the country outside of California and should seek comment on such an approach in any forthcoming implementation rule proposal for the 2015 Ozone NAAQS.

San Antonio Council Member Ron Nirenberg
Chair, AACOG AIR Executive Committee

4/29/2016
Date

Travis County Judge Sarah Eckhardt
Chair, CAPCOG CAC

4/29/16
Date

From: Julia Rathgeber
To: Kristin Patton
Subject: Comments regarding TCEQ"s proposed attainment and nonattainment designation recommendations for 2015 Ozone NAAQS
Date: Friday, April 15, 2016 2:03:14 PM

Kristin,

The Association of Electric Companies of Texas ("AECT") appreciates the opportunity to submit these comments regarding the TCEQ Air Quality Division's ("AQD") proposed attainment/nonattainment designation recommendations for counties for the 2015 ozone National Ambient Air Quality Standard ("NAAQS"). AECT is an industry trade association representing electric companies in Texas. Organized in 1978, AECT provides a forum for member companies' representatives to exchange information on their industry, and to communicate with state and federal governmental officials. This letter is being submitted on behalf of the following AECT members: AEP, CenterPoint, Entergy, GDF Suez, Luminant, NRG, Oncor, and Xcel Energy.

AECT supports TCEQ AQD's decision to propose to recommend (i) designation of a county as attainment if it has at least one regulatory ozone monitor, and the 2013-2015 design value for each such monitor in the county does not exceed 70 ppb, and (ii) designation of a county as unclassifiable/attainment if does not have a regulatory ozone monitor. AECT also supports TCEQ AQD's decision to propose to recommend designation of a county as nonattainment only if the county (i) has a regulatory ozone monitor with a 2013-2015 design value that exceeds 70 parts per billion (ppb), or (ii) is currently designated as nonattainment for the 2008 ozone NAAQS. However, AECT requests that the attainment/nonattainment designation recommendations document that TCEQ provides to the Governor, and that the Governor ultimately provides to EPA, specifies that if the 2014-2016 design value for any of the three counties for which TCEQ AQD is proposing to recommend as new nonattainment counties (i.e., Bexar County, El Paso County, and Hood County) does not exceed 70 ppb, Texas' recommended designation for that county will change to attainment.

AECT appreciates the opportunity to submit these comments. Please let me know if you have any questions.

Julia Rathgeber
President & CEO
512-474-6725

April 15, 2016

Kristin Patton
MC 206
State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality,
P.O. Box 13087,
Austin, Texas 78711-3087
Via Email

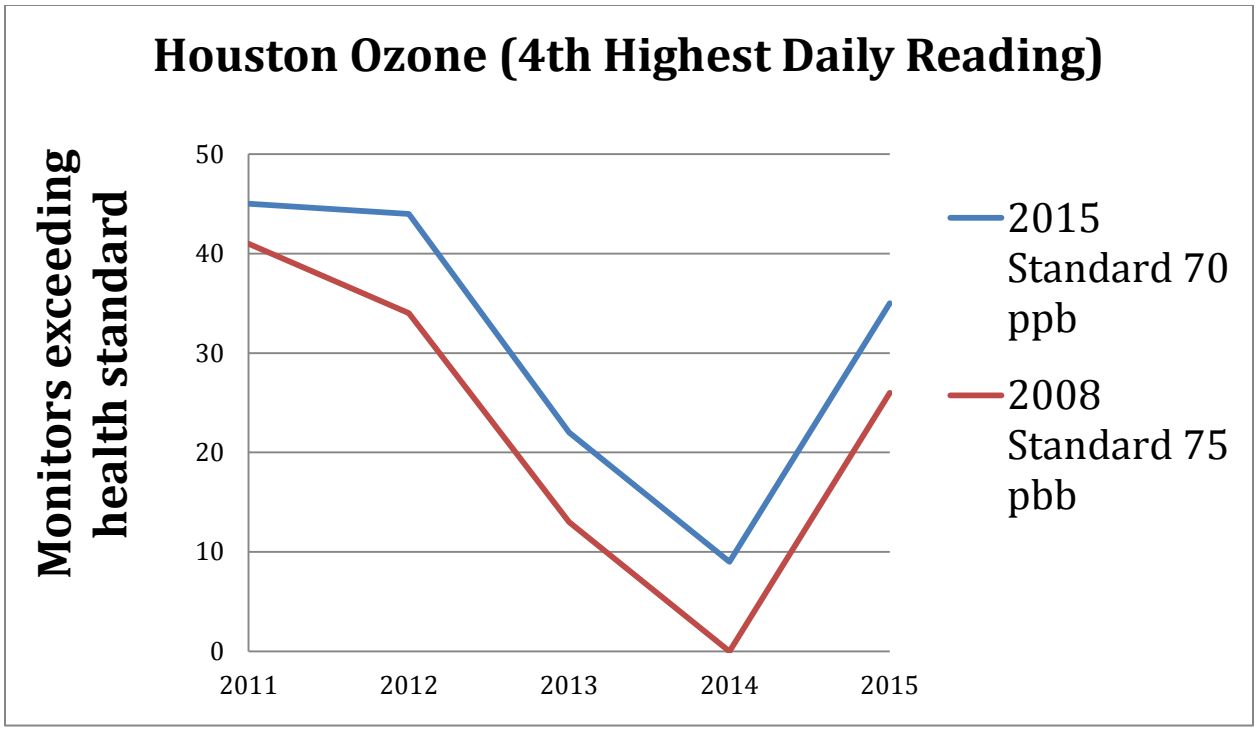
Re: 2015 Ozone NAAQS Designation Recommendations

Dear Ms. Patton:

Environmental Defense Fund greatly appreciates the opportunity to comment on the Texas Commission on Environmental Quality (TCEQ)'s recommendation regarding potential area designations and boundaries under the 2015 ozone national ambient air quality standards (NAAQS). EDF's Texas team of scientists, economists, attorneys and experts look for innovative solutions to the state's unique environmental challenges and our organization has a long history of engagement on air quality in the state.

I. Houston-Galveston-Brazoria (HGB) Non-Attainment Area (NAA)

Air quality in the Houston region has improved over the past two decades due to federal health standards and state implementation. However, the more than 6.5 million area residents are still breathing unhealthy air and local air quality has worsened recently. The number of air monitors in the Houston area that exceeded the 2008 ozone National Ambient Air Quality Standards (NAAQS) on their fourth highest day jumped from zero in 2014 to 26 in 2015, as shown in the chart below. These exceedances are significant because the three-year design value upon which the standard is based remained stagnant in 2015, reversing a general downward trend in design value over the past few years. 2015 represented a backsliding in air quality and demonstrates that much more needs to be done to reduce emissions.



EDF supports designating nonattainment areas for the 2015 ozone standard from a minimum baseline of the 2008 ozone standard NAA. These counties meet EPA's guidance on area designations for the 2015 ozone NAAQS and are currently designated as marginal nonattainment for the 2008 ozone NAAQS. Given that the region experienced significant ozone pollution in 2015, TCEQ should take additional measures to address emissions. This includes expanding the NAA to neighboring counties whose emissions contribute to ozone exceedances in the HGB area.

Last year, 20 of 21 regulatory monitors in the area recorded 4th-highest eight-hour ozone concentrations above the 2015 standard of 70ppb. The magnitude above the standard is also significant as 11 regulatory monitors recorded 4th-highest eight-hour ozone concentrations above 80ppb[1]. This effectively helps lock the area into a design value above the 2015 standard in the near term and means that the region must take significant steps to reduce ozone pollution.
This year, there have already been two days where at least one regulatory monitor in the Houston area measured ozone above 70ppb – nearly a month earlier than the first exceedance in 2014 or 2015[2]. These data show that more aggressive action is required to bring the HGB area into attainment.

A regional approach to air quality has proven effective in reducing emissions. This approach allows for strategic planning, coordination of resources, and an integrated approach to

[1] https://www.tceq.texas.gov/cgi-bin/compliance/monops/8hr_4highest.pl. Accessed April 4, 2016.
[2] https://www.tceq.texas.gov/cgi-bin/compliance/monops/8hr_exceed.pl. Accessed April 5, 2016.

controlling and preventing air pollution. EDF recommends that the 2015 ozone NAA include all area counties that contribute to elevated levels of ozone in the Houston region.

II. Bexar Nonattainment Area/ San Antonio-New Braunfels MSA/Eagle Ford Shale

For the San Antonio and Eagle Ford Shale area TCEQ recommends to designate only those counties that contain regulatory ozone monitors measuring over the 2015 ozone NAAQS of 70 parts per billion, or that are designated as nonattainment for the 2008 ozone NAAQS, as nonattainment. TCEQ further proposes to designate all areas that do not have a regulatory monitor as unclassifiable/attainment and those that have a regulatory monitor with design values below the 2015 ozone NAAQS as attainment. As a result, TCEQ proposes to designate all of the San Antonio-New Braunfels MSA as unclassifiable/attainment except for one county, Bexar. TCEQ further proposes to designate counties nearby Bexar county that are home to considerable oil and gas activities in the Eagle Ford Shale as unclassifiable/attainment.

TCEQ's approach to designating nonattainment area and boundaries under the 2015 ozone NAAQS is contrary to the plain language of the Clean Air Act and EPA guidance. As a result TCEQ fails to consider relevant data demonstrating that emissions from counties in the Eagle Ford shale impact air quality in the San Antonio-New Braunfels MSA including Bexar county. Accordingly, we recommend TCEQ:

- Undertake an analysis of what areas in the San Antonio region are contributing to nonattainment in nearby areas. This should specifically include an evaluation of whether other counties in the San Antonio-New Braunfels MSA (specifically, Atascosa, Bandera, Bexar, Comal, Wilson, Kendall, Comal, Medina and Guadalupe) should be considered as part of the boundary for the proposed Bexar county nonattainment area and whether any or all of the counties that make up the Eagle Ford Shale should be nonattainment; and
- Evaluate available, cost effective mechanisms to reduce ozone precursor emissions arising from oil and gas activities in the Eagle Ford shale in light of the plethora of available cost effective control mechanisms. These mechanisms may include permitting requirements or rules that eliminate or minimize ozone precursor emissions associated with oil and gas activities. Expeditious implementation of these actions now can help ensure the state is able to meet its current and future Clean Air Act obligations.

A. **TCEQ Must Designate Areas that Contribute to Ambient Air Quality that Does Not Meet National Ambient Air Quality Standards as Nonattainment**.

1. TCEQ Should Evaluate Whether the San Antonio-New Braunfels Metropolitan Statistical Areas Should Serve as a Nonattainment Area Boundary.

TCEQ's recommendation to designate only one county in the San Antonio/Eagle Ford shale area as nonattainment with the 2015 health-based standard for ozone is contrary to the Clean Air Act

and clear guidance from EPA. In designating areas as nonattainment with the 2015 ozone NAAQS TCEQ evaluated only whether or not an area is violating the NAAQS. It wholly failed to consider whether or not an area is contributing to nonattainment in a nearby area, regardless of whether or not the potentially contributing area contains a violating monitor.

Section 107(d)(1) of the Clean Air Act requires states to designate as nonattainment two types of areas: those that are violating the national ambient air quality standards (NAAQS) and those that are contributing to a violation.[3] A violating area is one that contains a regulatory monitor that shows a violation of the NAAQS.[4] A contributing area is one that is contributing to a violation of the NAAQS in a nearby area, even though the contributing area itself is not violating the NAAQS.[5] A state (or EPA) may designate as nonattainment any area that "exacerbates" nonattainment nearby, a flexible standard that courts have recognized as central to the "very purpose" of Section 107(d) area designations. *See Catawba Cnty., N.C. v. EPA*, 571 F.3d 20, 39 (D.C. Cir. 2009).

EPA has issued guidance to states that clearly lays out the steps states should follow in designating contributing nonattainment areas. Per the guidance for the 2008 and 2015 ozone NAAQS, EPA "believes it is important to examine ozone-contributing emissions across a relatively broad geographic area associated with a monitored violation."[6] Accordingly, when determining the boundary of a nonattainment area EPA recommends states "consider information relevant to designations associated with the counties in the Combined Statistical Area, or where appropriate, the Core Based Statistical Area (CBSA) in which the violating monitor(s) are located."[7] Notably, this is a well-established practice applied by EPA when determining nonattainment boundaries for prior ozone and particulate matter NAAQS.[8] This is "because the factors used to establish the CBSAs and CSAs are similar to the factors EPA plans to consider in determining whether a nearby area is contributing to the violation(s) of the standard."[9]

TCEQ erred in not considering whether the entire San Antonio-New Braunfels Metropolitan Statistical Areas (MSA), which is part of the CBSA, should serve as the boundary for the

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[3] 42 U.S.C. § 7407(d)(1) (requiring states to designate as nonattainment "any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standards for the pollutant").
[4] Feb. 25, 2015 Memorandum from Janet G. McCabe to Regional Administrators re: "Area Designations for the 2015 Ozone National Ambient Air Quality Standards," (hereinafter "2015 Guidance"), available at https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs.
[5] Id.
[6] 2015 guidance at 5; Dec. 4, 2008 Guidance from Robert J. Meyers to Regional Administrators re: "Area Designations for the 2008 Ozone National Ambient Air Quality Standards," (hereinafter "2008 Guidance"), available at https://www.mwcog.org/uploads/committee-documents/al5cX1ZY20090210140249.pdf.
[7] 2015 Guidance. The CBSA refers to both the Metropolitan Statistical Areas and Micropolitan Statistical Areas.
[8] 2015 Guidance; 2008 Guidance; see also *Catawba*, 571 F.3d 20 (discussing designation process for the PM NAAQS).
[9] 2008 Guidance.

nonattainment area that includes Bexar county. The design value for the MSA exceeded the 2015 ozone NAAQS in each of the past three years (in 2013 the design value for the MSA was 81, in 2014 it was 80 and in 2015 the design value was 78).

In addition, Bexar, Comal, Wilson and Guadalupe were the subject of an Early Action Compact approved by TCEQ in 2002. At that time TCEQ acknowledged the interrelationship between air quality in Bexar and surrounding counties. We urge TCEQ to consider this connection again here.

Per EPA guidance and longstanding practice, TCEQ should evaluate whether all counties that are part of the San Antonio-New Braunfels MSA are contributing to nonattainment in Bexar county and therefore whether the San Antonio-New Braunfels MSA should serve as the nonattainment area boundary.

2. *An Evaluation of the Five Factor Contributing Area Boundary Test Suggests Emissions from the Eagle Ford May be Contributing to Nonattainment in Nearby Areas.*

Recently the Alamo Area Council of Governments (AACOG) Air Improvement Resources Executive Committee recognized "the influence of transported pollution from beyond the San Antonio-New Braunfels region which current analysis shows to be responsible on average for 68% of the peak 1-hour high ozone on high ozone days recorded at local regulatory monitors in Bexar County."[10] The Air Improvement Resources Executive Committee is tasked with ensuring that the San Antonio-New Braunfels MSA attains the ozone NAAQS including determining what emission reductions are necessary to do so. In addition to evaluating whether other counties in the San Antonio-New Braunfels MSA contribute to nonattainment, TCEQ should also consider whether nearby counties are contributing to nonattainment. When undertaking this analysis EPA recommends states evaluate the following five factors:

- Air quality data
- Emissions and emissions-related data
- Meteorological data
- Geography/topography
- Jurisdictional boundaries

TCEQ failed to consider any of these five factors. There is compelling evidence indicating that emissions from the Eagle Ford impact air quality in Bexar county and in the San Antonio-New Braunfels MSA.

[10] Air Improvement Resources Mission Statement for Developing Air Quality Control Strategies, December 9, 2015.

1. Air Quality Data

EPA identifies two types of air quality data that are relevant to determining nonattainment boundaries for the 2015 ozone NAAQS: (1) monitored violations using the most recently available design values and (2) "historical ozone air quality measurement data (including previous design values)".[11] TCEQ only evaluated the first of these two types of air quality data. As discussed above, historical data from other monitors in the San Antonio-New Braunfels MSA suggests the MSA should form the nonattainment boundary for the area that includes Bexar county.

2. Emissions Data

According to EPA, "in the designation process, for each area with a violating monitor, the EPA evaluates the current emissions data from nearby counties to assess each county's potential contribution to ozone concentrations at the violating monitor(s) in the area under evaluation."[12] In considering emissions data from nearby counties, EPA recommends evaluating both the "magnitude of county-level emissions and the geographic locations of NOx and VOC sources."

TCEQ has not evaluated any emissions data from nearby counties, even though such information is readily available and demonstrates significant ozone precursors generated in the Eagle Ford shale. Specifically, an inventory prepared by AACOG (commissioned by TCEQ) estimated that oil and gas activities in the Eagle Ford contributed 121 tons of oxides of nitrogen and 223 tons of VOCs per ozone season day in 2012.[13] AACOG projected these emissions forward to 2018 assuming three different development levels. Both NOx and VOC emissions are projected to increase under all three scenarios. Indeed, AACOG estimates that VOC emissions will increase "significantly to 689 tons per ozone season day under the low development scenario" while NOx emissions will also increase slightly to 219 tons per day under the low development scenario.[14] More considerable increases are projected under the moderate and high development scenarios.[15] AACOG estimates that four counties, Karnes, La Salle, Dimmit and Webb, were responsible for the majority (53%) of NOx emissions in the Eagle Shale in 2012.[16] A similar situation is anticipated to exist in 2018 with respect to VOCs under the moderate development scenario where La Salle, Karnes, Dimmit and Webb are responsible for 147, 114, 131 and 84 tons per day during the ozone season.[17]

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[11] 2015 Guidance, p.5.
[12] Id. at p.5.
[13] Alamo Area Council of Governments, Technical Report, Oil and Gas Emission Inventory Update, Eagle Ford Shale (Oct. 20, 2015), available at http://www.aacog.com/DocumentCenter/View/34710.
[14] Id. at Table ES-1, iv.
[15] Id.
[16] Id.
[17] Id.

A recent analysis performed by the University of Texas at Austin (commissioned by TCEQ) compared hydrocarbon concentrations collected at different monitoring stations in Texas, including the Karnes County Auto-GC monitor in the Eagle Ford Shale. Not surprisingly, the results show significant concentrations of atmospheric hydrocarbons at the Karnes monitor reflecting the heavy oil and gas activity in the region. However, the analysis found hydrocarbon concentrations at this monitor (Karnes) to be **twice as high** as any other monitor in the state:

- When looking at the mean concentrations of 46 hydrocarbon species for 2015 (16/36). The Karnes City auto-GC monitor had the highest mean concentration for 35% of measured species (16/36).
- The Karnes City auto-GC had the largest mean for total non-methane hydrocarbons (301 ppbC) and this was roughly two times higher than the next monitor (Haden Road, Houston; 144 ppbC).

Given the magnitude of VOCs and NOx emitted from the Eagle Shale, TCEQ should evaluate the extent to which emissions from the Eagle Ford are contributing to nonattainment in nearby counties, degraded air quality and local health impacts.

3. Meteorological data

Meteorological data is another important factor to consider in identifying areas potentially contributing to the monitored violations.[18] In 2015 AACOG prepared a conceptual model that documented "variability of high ozone concentrations for the ozone season, weekdays, and weekends, and includes a description of the regional weather patterns and associated local meteorological conditions typically experienced during high ozone episodes in the San Antonio – New Braunfels Metropolitan Statistical Area (MSA) 8-County area, in particular, those episodes that are used to set the design values for the region."[19] The conceptual model further attempted to "detect the sources of region's transported ozone entering the area, and estimates locally-formed ozone using available monitoring data. The analysis helps identify most suitable high ozone events for evaluating the effects of ozone control measures within the photochemical modeling process."

The conceptual model notes that "[b]ecause prevailing winds in San Antonio are usually out of the southeast and cross the Eagle Ford Shale, it is important to assess the impact, if any, that these new emissions may have on San Antonio." The conceptual model notes that "winds on high ozone days [in San Antonio] were from the northeast, east, and southeast" and that "[a] similar pattern occurred with 1,000 meter back trajectories in which days of high ozone values are associated with winds that originate from the northeast, east, and southeast."[20] Since some of

[18] 2015 Guidance at 7.
[19] Alamo Area Council of Governments, Technical Report, Conceptual Model, Ozone Analysis of the San Antonio Region Updated through Year 2014, ii, (Oct. 23, 2015), available at http://www.aacog.com/DocumentCenter/View/34654.
[20] Conceptual Model at 8-2.

the Eagle Ford is to the southeast of the San Antonio, TCEQ should evaluate the extent to which ozone precursor emissions generated by oil and gas activities in the Eagle Ford shale are impacting air quality in the San Antonio MSA.

In 2013 AACOG conducted an extended June 2006 photochemical modeling episode ("2006 photochemical modeling episode"). This demonstrates that emissions from the Eagle Ford shale impact the regulatory ozone monitors in Bexar County.[21] This modeling relies on the projected 2018 emissions discussed above to estimate the impact of potential oil and gas impacts on local ozone levels assuming a low, moderate and high development scenarios. Estimated maximum changes in 8hr average ozone concentrations in Bexar County ranged from 1.8ppb to 7.8 ppb, or as much as 10% of ozone levels in San Antonio, depending on the anticipated level of activity in the Eagle Ford: low, medium or high.[22] While not all of these increases in peak 8hr ozone averages coincided with exceedances of the 70ppb standard, increased ozone levels would nonetheless introduce increased health risk for the local community, as adverse health effects have been documented at ozone concentrations as low as 60 ppb[23] and 53ppb.[24]

Table 6-2 of the 2006 photochemical modeling episode contains the maximum predicted impacts of the Eagle Ford at monitors in the San Antonio region in 2018.[25] Predicted ozone at C23, which is one of two monitors in Bexar County that typically measures the highest ozone concentrations in the region, increased by as much as 1.89 ppb in 2012 and between 1.81 to 3.09 ppb in 2018. The 2018 results at C58 were the same as C23 with the Eagle Ford contribution being between 1.81 to 3.09 ppb at the monitor. Since the C59 monitor is in southeast Bexar County and closer to the Eagle Ford, the impact was greater in 2018: 4.45 ppb to 7.82 ppb. Indeed, this report cautions that "if the EPA lowers the 8-hour ozone standard, it will be difficult for the San Antonio-New Braunfels MSA to meet the lower attainment threshold."[26] Since the release of this report in 2013 EPA has done just that by lowering the 2015 8-br NAAQS to 70 ppb.

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[21] "Development of the Extended June 2006 Photochemical Modeling Episode," October 2013, Natural Resources Department of the Alamo Area Council of Governments, (2006 Photochemical Modeling Episode), http://www.aacog.com/DocumentCenter/View/34700

[22] 2006 Photochemical Modeling Episode, Table 6-2: Maximum Change in 8-Hour Ozone at each Monitor, Eagle Ford Emission Inventories 2012 and 2018, ppb.
Pg. 254 of 261.

[23] Kim C.S., Alexis N.E., Rappold A.G., Kehrl H, Hazucha M.J., Lay J.C., Schnitt M.T., Case M., Devlin R.B., Peden D.B., Diaz-Sanchez D., 2011. Lung Function and Inflammatory Responses in Healthy Young Adults Exposed to 0.06 ppm Ozone for 6.6 Hours. *Am J Respir Crit Care Med* 183(9):1215-1221.

[24] Chen C.H., Chan C.C., Chen B.Y., Cheng T.J., Guo Y.L., 2015. Effects of particulate air pollution and ozone on lung function in non-asthmatic children. *Environmental Research*;137:40-48.

[25] 2006 Photochemical Modeling Episode, Table 6-2.

[26] Id.

Air quality impacts to Bexar County from Eagle Ford shale emissions were also evaluated in a modeling study by Pasci et al, at the University of Texas.[27] Results were directionally consistent with AACOG's modeling and predicted that 2012 levels of Eagle Ford shale emissions accounted for up to 2.5ppb ozone in Bexar County.

In late 2015, AACOG staff conducted an APCA modeling run, using the 2006 modeling episode and 2018 emission inventory, to determine contributions to San Antonio ozone concentrations by emission source groupings in the modeling domain.[28] A review of the APCA results, in accordance with latest EPA guidance, demonstrate a total of 10 days with peak 8hr average ozone values above 60ppb. On these days, the oil and gas sector contribution to ozone ranged from 0.4 ppb to 3.6 ppb, with an average value of 1.2 ppb. Contributions as small as 0.4 or 1.2 ppb could be sufficient to keep the area from achieving the 70ppb standard.

III. TCEQ Must Take Steps to Limit Oil and Gas Emissions in the Eagle Ford Given the Substantial Oil and Gas Activity and Evidence that Such Emissions Contribute to Degraded Air Quality.

Oil and gas activities in the Eagle Ford are responsible for considerable ozone precursor emissions. These emissions contribute to unhealthy air both in and around the Eagle Ford. To date, TCEQ has failed to require operators utilize modern pollution control technology to eliminate or minimize these emissions despite the availability of myriad cost effective solutions and the implementation of such solutions in many other jurisdictions home to significant oil and gas activity. In so doing, TCEQ is failing to fulfill its fundamental duty to protect human health and the environment. Accordingly, we urge TCEQ to require operators to implement modern pollution controls in accord with actions taken by leading states and proposed by federal regulators. Such actions will help ensure the state can meet current and future Clean Air Act obligations.

A. Emissions from the Oil and Natural Gas Sector Have Been Linked to Unhealthy Levels of Ozone

The oil and gas sector's substantial emissions have been linked to unhealthy levels of ozone pollution, including monitored ozone exceedances and ozone "action days" (days when the air quality in an area becomes unhealthy and people, especially susceptible populations, are encouraged to take certain precaution or stay indoors).[29] Examples include the following:

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[27] Pacsi, A. P., Kimura, Y., McGaughey, G., McDonald-Buller, E. C., Allen, D. T., 2015. Regional ozone impacts of increased natural gas use in the Texas power sector and development in the Eagle Ford Shale. *Environmental Science and Technology* 49, 3966-3973.

[28] MPO APCA Photochemical Modeling, available at http://www.aacog.com/DocumentCenter/View/34698.

[29] AirNow Action Days: http://airnow.gov/index.cfm?action=airnow.actiondays; Air Quality Guide for Ozone,

1. Wyoming. In designating Sublette County and portions of Lincoln and Sweetwater Counties in Wyoming as failing to attain the 2008 ozone standard, EPA noted that the ozone air quality problems were "primarily due to local emissions from oil and gas activities: drilling, production, storage, transport and treatment of oil and natural gas."[30] The Wyoming Department of Environmental Quality provided a similar assessment, and then-Governor Freudenthal recommended that parts of the Upper Green River Basin be designated as an ozone non-attainment area,[31] which EPA did in May of 2012.[32] Since this time, ozone levels have fallen. This decline is likely due in part to oil and gas air quality standards put in place by Wyoming Department of Environmental Quality.

2. Utah. The Utah Department of Environmental Quality has noted that "[i]ncreased oil and gas development in the Uinta Basin have [sic] led to environmental issues regarding air quality, water quality, and management of drilling wastes."[33] The Uinta Basin Winter Ozone Study found that the high ozone episodes observed in the December 2013 to March 2014 time period, which corresponded with colder temperatures, snow cover, and atmospheric inversions, were triggered by compounds "directly released from various emission sources and form in the atmosphere from directly emitted volatile organic compounds (VOCs) such as those emitted from oil and natural gas exploration and production activities."[34]

3. Texas. EPA has found that emissions from Wise County Texas, including from oil and gas collection and production in the Barnett Shale field, are contributing to unhealthy levels of smog in nearby Dallas-Fort Worth.[35]

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http://www.airnow.gov/index.cfm?action=pubs.aqiguideozone.

[30] 77 Fed. Reg. 34221 et. seq; see also EPA, TECHNICAL SUPPORT DOCUMENT, WYOMING AREA DESIGNATIONS FOR THE 2008 OZONE NATIONAL AMBIENT AIR QUALITY STANDARDS (2012), *available at* http://www.epa.gov/ozonedesignations/2008standards/documents/R8_WY_TSD_Final.pdf (Wyoming).

[31] Letter to Ms. Carol Rushin, Acting Regional Administrator from Governor Dave Freudenthal (March 12, 2009), http://deq.state.wy.us/AQD/Ozone/Gov%20Ozone%20to%20EPA%20(Rushin)_Final_3-12-09.pdf.

[32] 77 Fed. Reg. 30,088, 30,157 (May 21, 2012).

[33] Utah Dept. of Environmental Quality, "Uinta Basin, Ozone in the Uinta Basin," *available at* http://www.deq.utah.gov/locations/U/uintahbasin/ozone/overview.htm.

[34] "Final Report: 2014 Uinta Basin Winter Ozone Study" (2015) Prepared by Environ for the Utah Division of Air Quality, http://www.deq.utah.gov/locations/U/uintahbasin/ozone/docs/2015/02Feb/UBWOS_2014_Final.pdf.

[35] *Mississippi Comm'n on Envtl. Quality v. EPA*, No. 12-1309, slip opinion at 46 (D.D.C., June 2, 2015) available at https://www.cadc.uscourts.gov/internet/opinions.nsf/74C882991045080985257E580051699C/$file/12-1309-1555205.pdf.

B. *Numerous States Regulate VOCs and NOx from Oil and Gas Activities*

A number of states with significant oil and gas activities require operators to control or eliminate emissions. For example:

- Colorado requires the operators control VOC and methane emissions from new and existing storage tanks, equipment leaks, liquids unloading activities, pneumatic controllers, compressors, oil wells, and glycol dehydrators;[36]
- Wyoming requires operators control VOC emissions from new and existing storage tanks, glycol dehydrators, pneumatic controllers, pneumatic pumps, equipment leaks, and liquids unloading activities;[37]
- Pennsylvania requires operators routinely check for and repair equipment leaks at compressor stations using modern leak detection equipment;[38]
- Ohio requires operators routinely check for and repair equipment leaks at well sites using modern leak detection equipment[39] and proposed the same for operators of compressor stations;[40]
- California has proposed to require operators control methane emissions from a suite of new and existing oil and gas equipment and activities, including storage vessels, compressors, liquids unloading activities, equipment leaks, and pneumatic controllers and pumps.[41]

We urge Texas to modernize its outdated regulations by proposing state emission control requirements that track requirements required or proposed in other states home to significant oil and gas development.

C. *TCEQ has a Duty to Ensure that its State Implementation Plan Ensures that Areas Can Meet and Maintain the National Ambient Air Quality Standard*

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[36] Colorado Department of Public Health and Environment, 5 C.C.R. 1001-9, CO Reg. 7, §§ XVII.C, XVII.F.4.b, XVII.H, XVIII.C.1.b and XVIII.C.2.b, XVII.D (Feb. 24, 2014) *available at* https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=5670&fileName=5%20CCR%201001-9.

[37] Wyoming Department of Environmental Quality, Oil and Gas Production Facilities Permitting Guidance (Revised Oct. 2015), pp. 6, 11, 13, 17, 19 and 21 (storage tanks), 7, 14 and 19 (glycol dehydrators), 10, 15 and 20 (pneumatic controllers), 9, 15 and 20 (pneumatic pumps), and 12 (liquids unloading), *available at* http://deq.wyoming.gov/media/attachments/Air%20Quality/Rule%20Development/Proposed%20Rules%20and%20Regulations/Oil-and-Gas-Guidance-Revision_Draft-9-24-2015.pdf.

[38] Pa. Dep't of Envtl. Prot., General Permit for Natural Gas Compression and/or Processing Facilities (GP-5), Section G ("Pennsylvania General Permit"), *available at* http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-94153/2700-FS-DEP4403.pdf.

[39] Ohio Envtl. Prot. Agency, General Permit 12.1, available at http://epa.ohio.gov/dapc/genpermit/oilandgaswellsiteproduction.aspx.

[40] Ohio Envtl. Prot. Agency, Proposed General Permit 18.1, available at http://epa.ohio.gov/dapc/genpermit/permitsec.aspx.

[41] California Draft Proposed Regulation Order (Feb. 4, 2016 Draft), *available at* http://www.arb.ca.gov/cc/oil-gas/meetings/Draft%20ARB%20OG%20Regulation_Feb%201%202016%20Clean.pdf

Section 110(a)(1) of the CAA requires that the state implementation plans "provide[s] for implementation, maintenance, and enforcement of [the NAAQS] in each air quality control region (or portion thereof) within such state." These implementation plans are required to:

- include enforceable emission limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emission rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of this Act; (§ 110(a)(2)(A))
- include a program to provide for the enforcement of the measures described in subparagraph (A), and the regulation of the modification and construction of any stationary source within the areas covered by the plan as necessary to assure that national ambient air quality standards are achieved, including a permit program as required in parts C and D;(§ 110(a)(2)(C))
- contain emission limitations and such other measures as may be necessary, as determined under regulations promulgated under [part C], to prevent significant deterioration of air quality in each region (or portion thereof) designated pursuant to section 107 as attainment or unclassifiable; (§ 161)
- the maximum allowable concentration of any air pollutant in any area to which [part C] applies shall not exceed a concentration for each pollutant for each period of exposure equal to – (A) the concentration permitted under the national secondary ambient air quality standard, or (B) the concentration permitted under the national primary ambient air quality standard, whichever concentration is lowest for such period of exposure. (§ 161(b)(4));

Pursuant to its Section 110(a)(1) obligation to ensure the implementation, maintenance and enforcement of the NAAQS in each air quality control region, TCEQ should consider imposing controls on oil and gas activities in the Eagle Ford. The modeling and other data discussed above demonstrate that Eagle Ford emissions are adversely impacting air quality in the Metropolitan San Antonio Intrastate Air Quality Control Region. As demonstrated by permit requirements and rules imposed or required in other states, there are numerous cost effective mechanisms available to eliminate or minimize ozone precursor emissions associated with oil and gas activities. These include quarterly leak detection and repair requirements, the use of no or low-bleed pneumatic devices, 98% control of venting from storage tanks, compressors, and well unloading activities, and the capture or control of associated gas from oil wells. We urge TCEQ to evaluate the available controls and impose additional limits on oil and gas emissions in the Eagle Ford shale in order to protect the public health and welfare of those living in and near the Eagle Shale.

Thank you for the opportunity to comment. Please do not hesitate to contact us with any questions.

Sincerely,

Colin Leyden
Texas Regulatory & Legislative Affairs, EDF

Elena Craft, PhD
Senior Health Scientist, EDF

TEXAS OIL & GAS ASSOCIATION | SINCE 1919

Jonny Jones
Chairman

D. Todd Staples
President

April 15, 2016

Kristin Patton
MC 206, State Implementation Plan Team, Office of Air
Texas Commission on Environmental Quality (TCEQ)
P.O. Box 13087
Austin, Texas 78711-3087

Re: Comments Regarding the 2015 Ozone NAAQS Designation Recommendations

Ms. Patton:

The Texas Oil & Gas Association ("TXOGA") is a non-profit corporation representing the interests of the oil and gas industry in the State of Texas. Founded in 1919, TXOGA is the largest and oldest petroleum organization in Texas, representing more than 5,000 members. The membership of TXOGA produces in excess of 90 percent of Texas's crude oil and natural gas, operates nearly 100 percent of the state's refining capacity, and is responsible for the vast majority of the state's pipelines. In 2014, the oil and gas industry employed 429,000 Texans, providing wages and salaries of over $52 billion in Texas alone. In addition, large associated capital investments by the oil and gas industry generate significant secondary economic benefits for Texas.

TXOGA appreciates the opportunity to comment on the Texas Commission on Environmental Quality's ("TCEQ's") potential state designation recommendations and boundaries, in preparation for the Governor's submittal of recommendations to the Environmental Protection Agency ("EPA") in October 2016 for the 2015 revised ozone National Ambient Air Quality Standard ("NAAQS").

TXOGA supports the use of regulatory ozone monitors and TCEQ's determination that counties without regulatory ozone monitors be recommended to have a designation of unclassifiable/attainment. TXOGA also supports that all counties with measured design values at or below the level of the standard be recommended to have a designation of attainment.

TCEQ has recommended new nonattainment designations for Bexar, Hood, and El Paso Counties based on 2013 to 2015 data that indicates exceedances of the 2015 ozone NAAQS. TXOGA encourages TCEQ to first use relevant information available in determining attainment and nonattainment status and boundaries, including data that indicates the influence of exceptional events, control measures, and geographic distribution of monitors with design values above the level of the ozone standard. In particular, TXOGA believes that additional information related to exceptional events will satisfy EPA exceptional

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events rule and result in a demonstration that will permit TCEQ to recommend that a county be designated as unclassifiable, rather than nonattainment.

With respect to the geographic distribution of monitors with current design values above the level of the 2015 ozone standard, should TCEQ be unable to develop successful exceptional event demonstrations, then TCEQ should consider whether a nonattainment area smaller than a full county may be appropriate. For example, in El Paso County, of the six regulatory ozone monitors, only one monitor, the UTEP monitor, has measured a 4th high ozone value above the level of the 2015 standard in the years 2012 through 2015. Furthermore, only one other monitor measured a 4th high above the level of the standard in 2011, and its 4th high was just 1 ppb above the standard.

Again, we thank you for the opportunity to comment on this critical step towards implementing the 2015 ozone NAAQS standard. Should you have any questions, please contact Mari Ruckel at mruckel@txoga.org or (512) 478-6631.

Sincerely,

Todd Staples
President, Texas Oil and Gas Association

April 15, 2016

Kristin Patton, MC 206
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Office of Air
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RE: 2015 Ozone NAAQS Designation Recommendations

The definition of insanity is doing the same thing over and over again, but expecting a different result.

--Albert Einstein[1]

On behalf of their thousands of members and supporters who are harmed by ozone pollution in Texas, Sierra Club and Downwinders at Risk (collectively, "Clean Air Organizations") respectfully submit these comments regarding the Texas Commission on

[1] Although this quote is generally attributed to Einstein, there seems to be significant debate about the authenticity of this attribution. Others like Mark Twain, an old Chinese proverb, and Benjamin Franklin have also been suggested as the originators.

Environmental Quality's ("TCEQ") Potential State Designation Recommendations for the 2015 National Ambient Air Quality Standard ("NAAQS") for ozone.

While we commend TCEQ for initiating the state designation recommendation process for the 2015 ozone NAAQS in a timely manner, certain areas of Texas have suffered from some of the worst air quality in the United States for decades. Indeed, the Dallas-Fort Worth ("DFW") area has never complied with any of the Environmental Protection Agency's ("EPA's") NAAQS for ozone. And as TCEQ recognizes in its proposed ozone nonattainment designations, DFW's failure to comply with the more protective 2015 ozone NAAQS will be no different. This is, in large part, due to TCEQ's repeated failure to take the necessary steps to address pollution from nearby coal-burning power plants, which contribute significantly to DFW's air quality problems.

Although the DFW area continues to struggle to meet clean air safeguards, TCEQ's history of failing to ensure healthy air for Texas residents need not to repeat itself. There is a solution to DFW's apparently perpetual nonattainment. As discussed below, TCEQ can and should recommend that EPA include in its 2015 ozone NAAQS nonattainment designation for DFW the nearby East Texas coal-fired electric generation units ("EGUs")—Martin Lake, Monticello, Big Brown, Limestone, and Welsh—which are among the State's largest individual sources of the ozone precursor, nitrogen oxide ("NO_x").

Properly drawing the lines of the 2015 ozone nonattainment boundaries is a critical first step in bringing all of the contributing to the table and achieving healthy air quality for the DFW area. If those five East Texas coal plants that contribute to DFW nonattainment reduce coal burning or install "end of the pipe" pollution controls to reduce NOx, there would not only be meaningful reductions in ozone levels in the DFW area—one of the largest metropolitan areas in the country with a population approaching 8 million people—but there would also be the potential for other public health co-benefits across Texas.

Additionally, and for the same reasons, we urge TCEQ to include Bexar County and a group of seven additional counties within the San Antonio-New Braunfels Metropolitan Statistical Area (MSA) in its recommended nonattainment designations for the 2015 EPA ozone standard.

I. BACKGROUND

For nearly forty years, residents in and around the DFW area have been consistently exposed to some of the highest ozone levels in the United States. In fact, as far back as data is available—from the 1960's and 1970's—the DFW area has never attained EPA's current NAAQS for ozone, and far exceeds the ozone levels current scientific research dictates as necessary to protect human health. And as TCEQ recognizes, Texas's persistent failure to comply with the NAAQS for ozone in the DFW area promises to continue with EPA's more protective 2015 standard. Recent epidemiological studies demonstrate, however, that modest reductions in ozone in the DFW area would save hundreds of millions of dollars in avoided medical costs, mortalities, and other economic impacts on vegetation and agricultural crop yields.

A. Ground-Level Ozone Is Dangerous to Human Health

Scientific research continues to strengthen our understanding of the harm that ozone causes to public health. Indeed, exposure to ozone is connected to a wide range of significant human health impacts including respiratory and cardiovascular morbidity, premature mortality, and central nervous system and developmental impacts have been demonstrated through controlled human exposure, epidemiologic, and toxicological studies.[2] These include demonstrated respiratory and cardiovascular morbidity, premature mortality, and perinatal and reproductive impacts, along with other suggested impacts such as to the central nervous system. The physiological impacts of ozone exposure are experienced even by healthy individuals and even at relatively low concentrations of ozone. Moreover, there is a growing body of scientific evidence showing that repeated exposure over time causes additional health impacts which may even be more severe and less reversible.

Research on the relationship between ozone exposure and respiratory effects is well documented. Epidemiologic studies have demonstrated consistently that increasing concentrations of ozone are associated with lung function decrements, increases in respiratory symptoms, pulmonary inflammation in children with asthma, increases in respiratory-related hospital admissions and emergency department visits; and increases in respiratory mortality.

Ozone exposure has also been linked to not only the exacerbation of asthma, but also to asthma induction and new development of the disease. For individuals already diagnosed with asthma, evidence shows that ozone exposure increases the likelihood of having an asthma attack.[3] Ozone exposure has been shown to have especially significant effects on asthma exacerbation among children. Children living in areas with higher ambient ozone concentrations have been shown to be more likely to either have asthma or to experience asthma attacks compared with children living in areas having lower ambient ozone concentrations.[4]

Evidence also shows positive associations between long-term exposures to ozone and new-onset asthma. For adults, studies demonstrate increased risks for developing asthma per each 10 ppb increase in annual mean ozone or 8-hour average.[5]

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[2] *See* U.S. Environmental Protection Agency (2013). Integrated Science Assessment for Ozone and Related Photochemical Oxidants (Final Report) EPA/600/R-10/076F, 2013, *available at* http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=247492 [hereinafter, "ISA (2013)"].

[3] *See, e.g.*, Franze et al., Protein nitration by polluted air, Enviro Sci Technol. 39: 1673-1678 (2005), http://dx.doi.org/10.1021/es0488737; .U.S. Environmental Protection Agency, Air quality criteria for ozone and related photochemical oxidants [EPA Report], (EPA/600/R-05/004AF) (2006), http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=149923.

[4] Akinbami, The association between childhood asthma prevalence and monitored air pollutants in metropolitan areas, United States 2001-2004 (Environ Res. Apr. 2010), 110(3):294-301, http://dx.doi.org/10.1016/j.envres.2010.01.001.

[5] McDonnell et al., Long-term ambient ozone concentration and the incidence of asthma in nonsmoking adults: the Ahsmog study, Environ Res 80: 110-121 (1999), http://www.ncbi.nlm.nih.gov/pubmed/10092402; Greer et al., Asthma related to occupational

Ozone exposure is most often linked to adverse respiratory effects, but is also associated with adverse cardiovascular effects. Ozone exposures are shown to increase risks of hospitalization for acute myocardial infarction, coronary atherosclerosis, stroke, and heart disease, even at ambient ozone levels well-below current NAAQS.[6] New research also shows that chronic ozone exposure may put children at risk for cardiovascular disease later in life.[7]

Epidemiological and toxicological studies also show a strong relationship between short-term ozone exposures and premature mortality.[8] Numerous studies across the United States, Canada, and Europe—including multi-city, multi-continent, and single city studies—demonstrate positive links between ambient ozone concentrations and respiratory-related mortality. Across communities, a 10 ppb increase in the prior week's ozone level was associated with a 0.52% increase in mortality.

Additionally, certain "sensitive" groups and individuals are found to have significantly greater susceptibility to ozone-related health impacts. In a 14-year study of 95 U.S. cities, links were found between short-term increases in ozone and premature mortality, even when excluding days exceeding 60 ppb, finding that that "daily changes in ambient O_3 exposure are linked to premature mortality, even at very low pollution levels."[9] Other health impacts linked to ozone exposure are related to newborns and the developing fetus.[10] Prenatal exposure to ozone has been linked to reduced birth weight, premature delivery, and birth defects.[11]

B. Ozone Presents a Serious Public Health Concern in Texas.

Texas's failing air quality has serious and well-documented health consequences for the more than 7 million Texans who live in the DFW area, and which has air quality that has

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and ambient air pollutants in nonsmokers., J Occup Environ Med 35: 909-915 (1993), http://www.ncbi.nlm.nih.gov/pubmed/8229343.

[6] *See* ISA (2013) at 6-196 to 6-201.

[7] Breton et al., Childhood air pollutant exposure and carotid artery intima-media thickness in young adults
Circulation, 126:1614-1620 (2012), http://www.ncbi.nlm.nih.gov/pubmed/22896588; Adar, Childhood exposures to ozone: the fast track to cardiovascular disease?, Circulation, Sep 25;126(13):1570-2 (2012), http://www.ncbi.nlm.nih.gov/pubmed/23008468.

[8] *See generally* ISA (2013) and U.S. Environmental Protection Agency, Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards, Second External Review Draft (2013) [hereinafter, "Policy Assessment (2014)"]. Both conclude that there is a likely causal relationship between short-term ozone increases and total mortality.

[9] Bell et al., The Exposure-Response Curve for Ozone and Risk of Mortality and Adequacy of Current Ozone Regulations, Environ Health Perspect. 114:532-536 (2006), *available at* http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1440776/.

[10] ISA (2013) at 2-20.

[11] Salam et al., Birth Outcomes and Prenatal Exposure to Ozone, Carbon Monoxide, and Particulate Matter: Results from the Children's Health Study, *Environ Health Perspec*.113: 1638-1644 (2005), http://dx.doi.org/10.1289/ehp.8111.

repeatedly been classified by EPA as unsafe to breathe.[12] In the Dallas-Fort Worth area, 14% of adults have asthma—the highest current asthma prevalence in adults in Texas.[13]

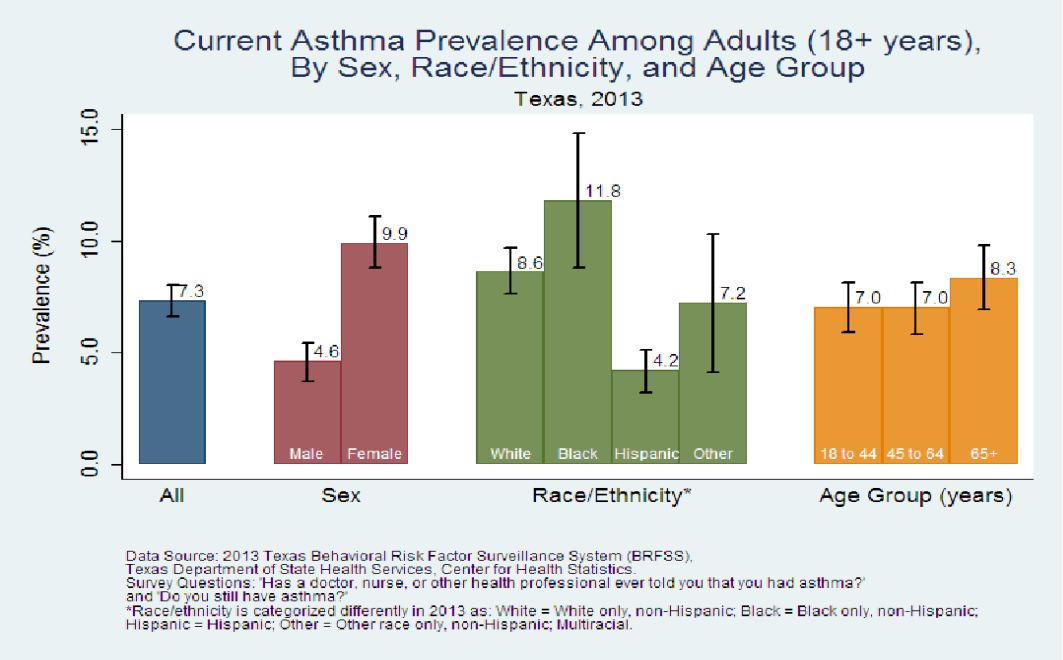

Figure 1 – Current Asthma Prevalence Among Adults in Texas[14]

[12] http://quickfacts.census.gov/qfd/maps/texas_map.html.
[13] Texas Dep't of State Health Services, 2014 Texas Asthma Burden Report at 7, *available at* https://www.dshs.state.tx.us/asthma/pdf/2014BurdenRpt.doc ("2014 Texas Asthma Report").
[14] 2014 Texas Asthma Report at 5.

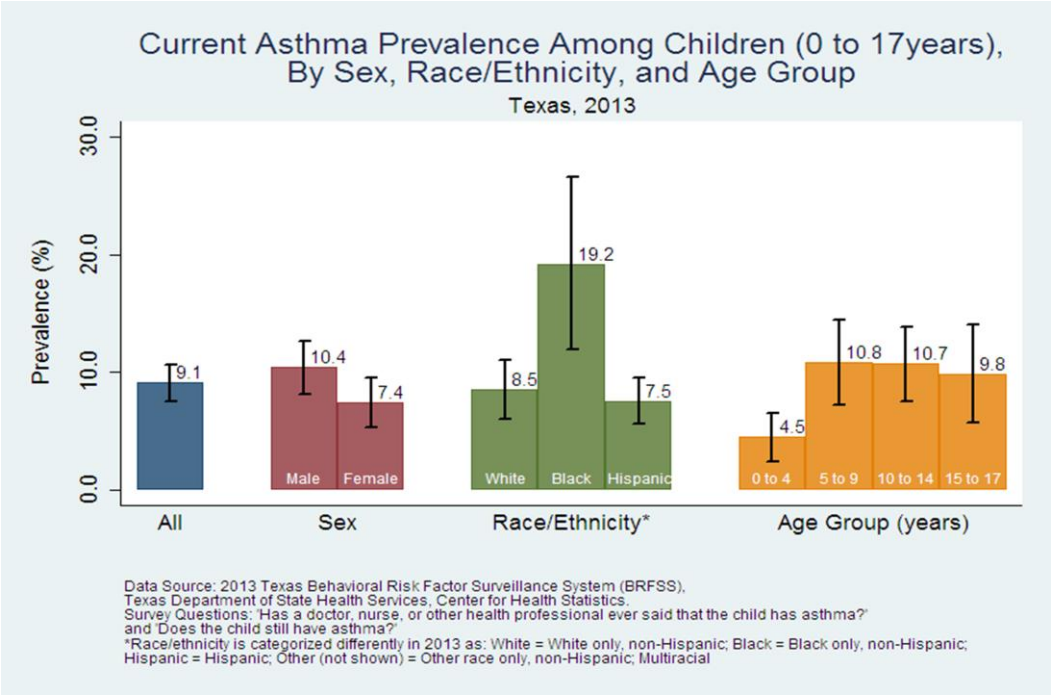

Figure 2 – Current Asthma Prevalence in Texas Among Children[15]

Alarmingly, more than 13% of Texas children under the age of 18 will have asthma over the course of their childhood, and nearly 9% of children currently have asthma.[16] In 2013, an estimated 7.3% of adults and 9.1% of children had asthma. This means that more than 1.4 million adults and 617,000 children in Texas had asthma.[17]

As the figures above indicate, children, the elderly, minorities, and low income households are especially sensitive to ozone, and often bear a disproportionate asthma burden. Non-Hispanic blacks have the highest asthma hospitalization rates out of any group in Texas—double the rate of non-Hispanic whites. Moreover, black Texans are twice as likely as white Texans to visit the emergency department for asthma.

[15] 2014 Texas Asthma Report at 9.
[16] Center for Disease Control, National Center for Environmental Health, Asthma in Texas, http://www.cdc.gov/asthma/stateprofiles/asthma_in_tx.pdf; Texas Dep't of State Health Services, 2010 Texas Asthma Burden Report, https://www.dshs.state.tx.us/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=8589994855.
[17] 2014 Texas Asthma Burden Report, https://www.dshs.state.tx.us/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=8589994855.

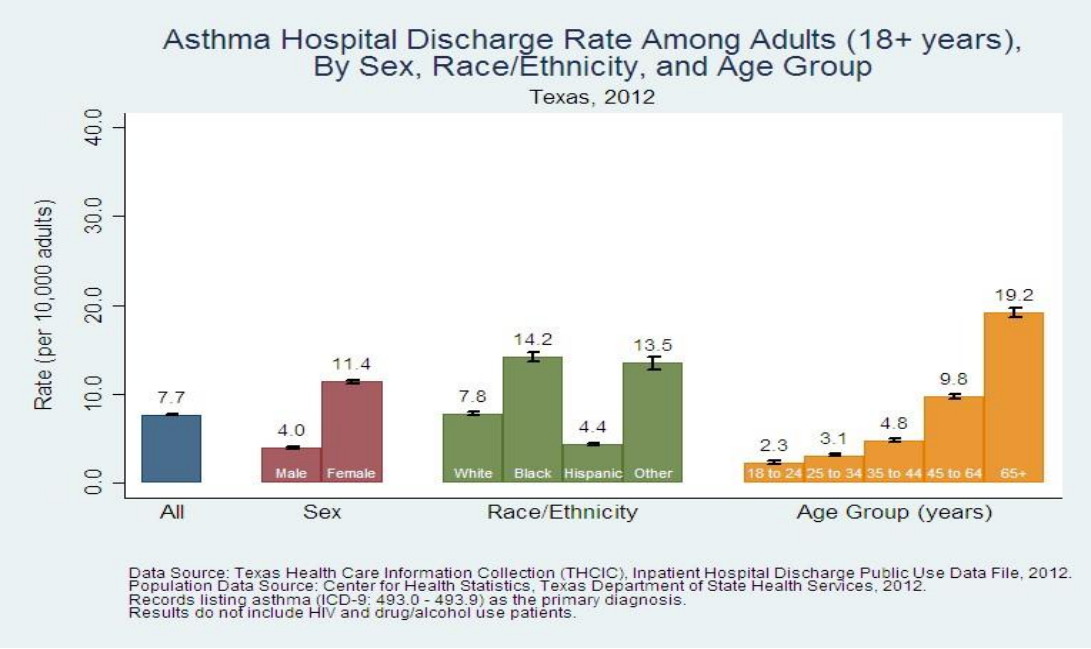

Figure 3 – Asthma Hospital Discharge Rate (Adults)[18]

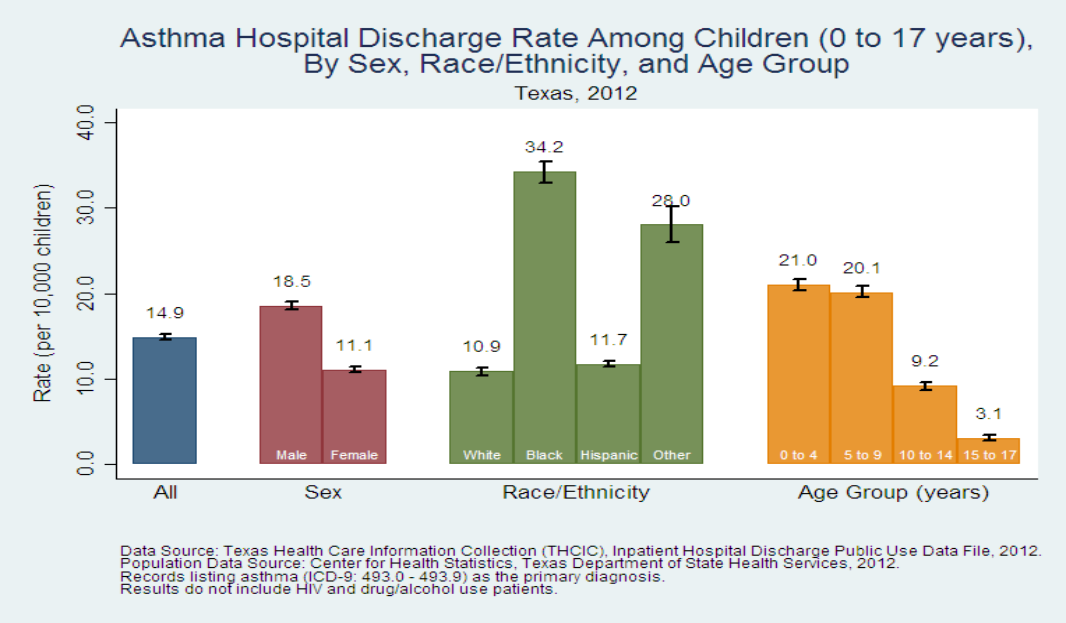

Figure 4 – Asthma Hospital Discharge Rate (Children)[19]

Black Texans are nearly 2.5 times more likely to die from asthma than white Texans.

[18] 2014 Texas Asthma Report at 12.
[19] 2014 Texas Asthma Report at 16.

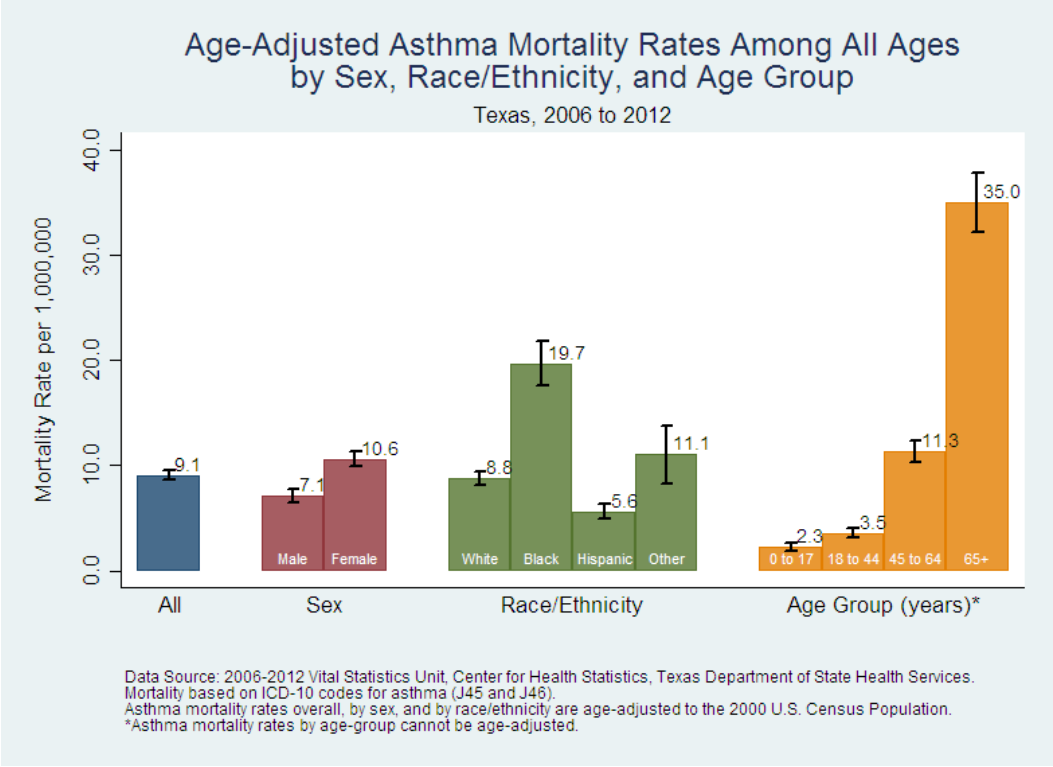

Figure 5 – Asthma Mortality Among All Groups[20]

C. Texas's Long History of Ozone Nonattainment in the Dallas-Fort Worth Area

For decades, Texas has failed to attain health-based standards for ozone pollution in the DFW area. Indeed, for more than forty years—throughout the implementation of the most recent 2008 ozone standard to the first 8-hour standard in 1997, and further back to the 1-hour standard, and then further back still to photochemical oxidant standards in the early 1970's—the DFW area has consistently failed to meet maximum ozone air quality standards designed to protect human health and welfare.[21] Although a number of federal-mandated and state and local programs have helped reduce levels of ozone precursors emissions in and around DFW, the area has air quality monitors that regularly reflect exceedances of air quality standards deemed necessary to protect human health.

Indeed, DFW residents are consistently exposed to some of the highest ozone levels in the central United States. Ozone levels in DFW exceed EPA's 1997 and 2008 ozone standards,

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[20] *Id*. at 20.

[21] See DFW AD SIP at 1-1 to 1-6. On February 10, 2015, the U.S. Environmental Protection Agency ("EPA") proposed to reclassify the Dallas-Fort Worth area ("DFW") as being in "severe nonattainment" of the original 1997 8-hour ozone standard of 84 parts per billion. *See* http://yosemite.epa.gov/opa/admpress.nsf/0/8b7bd47210a982d785257de80059af6b?OpenDocument. The DFW area has never been in attainment for any NAAQS established by EPA. The agency's proposed "bump up" to severe nonattainment comes five years after the state failed to timely comply with the 1997 standard.

and far exceed the maximum limits that current scientific research dictates are necessary to protect human health, and especially sensitive populations such as children, asthmatics, and the elderly. Currently, approximately 52% of Texans—over 14 million people—live in areas with air that has been classified by EPA as unsafe to breathe.[22] Texas's persistent failure to comply with the NAAQS for ozone in the DFW area, and the public's exposure to unhealthy air, promises to continue with EPA's more protective 2015 standard.

D. Reducing Ozone Levels Would Result in Significant Public Health and Economic Benefits.

A recent epidemiological study conducted by the University of Texas-Southwestern's Dr. Robert Haley on behalf of the Dallas County Medical Society provides a Dallas-Fort Worth specific estimate of the public health and economic costs of an additional five parts per billion ozone in the region's air shed.[23] Using the EPA-approved Environmental Benefits Mapping and Analysis Program ("BenMAP"), Dr. Haley estimated the health impacts and economic benefits associated with a 5 ppb reduction in ozone, as well as attainment of EPA's recently promulgated 70 ppb NAAQS. Dr. Haley concluded that with a 5 ppb reduction in ozone levels—the reduction estimated to result simply from curtailing emissions at the five largest coal-burning EGUs in East Texas—approximately 97 premature deaths could be avoided *each year* in the 34-county area of Northeast Texas.[24] Half of those avoided mortalities would occur in Tarrant (Ft. Worth) and Dallas Counties (City of Dallas).

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[22] *Compare* EPA's Greenbook, *available at* http://www.epa.gov/oaqps001/greenbk/ancl.html (listing Texas counties in nonattainment for 1997 and 2008 ozone standards), with Texas Dep't of State Health Servs., Texas Population 2014, *available at* https://www.dshs.state.tx.us/chs/popdat/ST2014.shtm (providing county-by-county population data).

[23] Ex. 1 (Robert Haley and Martha Carvour, *Health Effects Prevented by a 5 ppb drop in Ozone Levels* (Division of Epidemiology, Department of Internal Medicine, University of Texas Southwestern Medical Center 2015).

[24] *Id*. at 12.

Annual incidence					
County	Admissions for respiratory, ages 0-99, ± 50% (Ji et al.)	ER visits for respiratory, ages 0-99, ± 38% (Ji et al.)	Minor restricted activity days, ages 18-64, ± 29% (Ostro et al.)	Lost school days, ages 5-17, ± 54% (Gilliland et al.)	All cause mortality, ages 0-99, ± 16% (Levy et al.)
Dallas	53.5	116.3	49,552	40,548	26.3
Tarrant	43.7	96.2	40,944	33,542	22.4
Collin	20.8	51.9	23,077	18,185	9.6
Denton	20.5	42.5	19,259	14,655	7.2
Johnson	7.3	8.9	3,685	3,112	2.6
Ellis	4.4	8.0	3,322	2,811	2.1
Parker	4.9	7.4	3,198	2,419	2.4
Kaufman	4.7	6.3	2,625	2,220	1.9
Rockwall	2.2	5.3	2,241	1,889	1.3
Wise	1.8	3.1	1,346	1,033	0.9
All 10	163.8	345.9	149,249	120,415	76.8
34 counties	204.0	399.4	170,940	137,348	97.2

Figure 6—Adverse Events Avoided by a 5 ppb Reduction in Ozone[25]

The Haley study also estimates that a five ppb drop in ozone levels would prevent over 200 hospital admissions, 400 emergency room visits, over 170,000 days of restricted activity for all residents, and almost 140,000 lost school days *annually*, thereby avoiding approximately $650 million in lost economic productivity each year. Dr. Haley's study demonstrates the large public health and financial gains available to North Texas in return for decreasing ozone levels.

Reductions in ozone levels from the curtailment of emissions at the five largest coal plants in East Texas would not only result in significant direct public health, but would also yield substantial economic development and the creation of jobs. In addition to emissions reductions that could be achieved by requiring post-combustion control technology, Texas could achieve significant ozone reductions by imposing a mass based, tons per hour emission limit on each of the coal-fired boilers in East Texas. In light of Texas's rapidly expanding renewable energy and natural gas generation, the decrease in coal-fired generation in East Texas would be offset by increased generation at other fossil units as well as from wind and solar power. Thus, a mass-based emission limit would not only result in significant ozone reductions—as well as reductions in harmful greenhouse gas, sulfur dioxide, nitrogen oxide, and particulate matter emissions—but would stimulate economic development, job creation, and reduce electricity prices.[26]

[25] *Id.*

[26] A recent National Renewable Energy Laboratory study evaluating the costs and benefits of renewable portfolio standards concludes that decreased fossil fuel generation and corresponding increases in renewable energy generation yield significant societal and economic benefits. *See* Wiser et al., A Retrospective Analysis of the Benefits and Impacts of U.S. Renewable Portfolio Standards (NREL Jan. 2016) (Technical Report No. TP-6A20-65005), *available at* http://www.nrel.gov/docs/fy16osti/65005.pdf.

II. NONATTAINMENT DESIGNATIONS UNDER EPA'S REVISED 2015 OZONE NAAQS

A. EPA's Revised and More Protective 2015 Ozone NAAQS

In 2015, based on its review of the air quality criteria for ozone, EPA revised the primary and secondary NAAQS for ozone to provide the requisite level of protection of public health and welfare. EPA set the 2015 ozone NAAQS at 0.070 parts per million ("ppm") based on a three-year average of the annual fourth-highest daily maximum 8-hour average concentration. 80 Fed. Reg. 65292 (Oct. 26, 2015).

When EPA promulgates a new or revised national ambient air quality standard, the Clean Air Act, 42 U.S.C. § 7407(d)(1), requires the state to submit to EPA a list of all areas of the state that do not meet the standard. The state must also include in its proposed designations those "nearby" areas that "contribute" to violations of the standard. *Id*. § 7407(d)(1)(A)(i). EPA has consistently interpreted "contribute" to mean those areas and sources that "sufficiently contribute" to nonattainment. *Catawba County v. EPA*, 571 F.3d 20, 38-39, 41 (D.C. Cir. 2009) (upholding EPA's decision to designate sources as being in nonattainment with the NAAQS where the source is contributing to an areas with a violating monitor). Additionally, EPA has consistently found that impacts greater than one percent of the applicable NAAQS are "significantly" contributing to nonattainment.[27]

B. Where, as Here, Scientific Data Demonstrates That Sources in Non-Contiguous Areas Are "Significantly Contributing" to Monitored Violations of the NAAQS, TCEQ Can and Should Designate Those Areas as Nonattainment.

TCEQ need not limit itself to the boundaries for an existing nonattainment area or any defined Combined or Core Based Statistical Area in determining which counties to recommend as nonattainment. Indeed, EPA's guidance for area designations for the 2015 ozone NAAQS makes clear that the agency does not intend for the statistical boundary area surrounding any violating monitors to be "presumed nonattainment boundary."[28] In making nonattainment designations, it is "important to examine ozone-contributing emissions across a relatively broad geographic area associated with the monitored violation."[29] Moreover, EPA has indicated that in making nonattainment designations and determining which contributing "nearby" sources to include, states should conduct a fact- and area-specific evaluation of (1) air quality data at any violating monitors; (2) emissions and emissions-related data; (3) meteorological data (weather and transport); (4) geography and topography; and (5) relevant jurisdictional boundaries.

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[27] *See* 76 Fed. Reg. 80760 (Dec. 27, 2011) (final Cross State Air Pollution Rule); 75 Fed. Reg. 45210, 45232-37 (Aug. 2, 2010) (explaining application of one percent significance threshold in proposed Cross-State Air Pollution Rule); 70 Fed. Reg. at 25193 (Clean Air Interstate Rule); 63 Fed. Reg. at 57379-80 (NOx SIP Call).

[28] Memo. From Janet McCabe to Regional Administrators, Area Designations for the 2015 Ozone National Ambient Air Quality Standards at 6 9Feb. 25, 2016) [hereinafter, "2016 Guidance"].

[29] *Id*. at 5.

Where, as here, nearby sources are "sufficiently" contributing to nonattainment, EPA and the courts have recognized that those areas may be designated as nonattainment even if they are not immediately adjacent to the jurisdictional boundary of the nonattaining monitor. *See Catawaba County*, 571 F.3d at 41-43 (D.C. Cir. 2009) (upholding EPA's designation of noncontiguous areas where the contributions from a large stationary source were "sufficiently" contributing to nonattainment). As the D.C. Circuit noted in *Catawba County*, "the designations process does not mandate [contiguity] ***when the scientific data show that a source contributing to a violation is not in an area contiguous to the county with the violating monitor***." *Id*. at 42 (emphasis added); *see also Ohio v. Ruckelshaus*, 776 F.2d 1333, 1338 (6th Cir. 1985) (EPA is permitted to designate nonattainment areas by "boundaries which include important sources of pollution that contribute to the pollution levels of the area."). The same principles apply here.

III. DFW NONATTAINMENT DESIGNATIONS UNDER EPA'S REVISED 2015 OZONE NAAQS

As noted, in proposing nonattainment areas and determining whether to include "nearby" areas contribute to nonattainment, EPA's guidance directs the states to conduct a fact- and area-specific evaluation of (1) air quality data at any violating monitors; (2) emissions and emissions-related data; (3) meteorological data (weather and transport); (4) geography and topography; and (5) relevant jurisdictional boundaries. Because the scientific evidence makes clear that the large, uncontrolled coal-fired EGUs in East Texas—*i.e.*, Martin Lake, Monticello, Big Brown, Limestone, and Welsh—contribute significantly to exceedances of the 2015 ozone NAAQS in the DFW area, it would be arbitrary for TCEQ to omit those sources from the proposed nonattainment area.

A. Factor 1: Air Quality Data

Air quality data for the 2015 ozone design values will be based on the most recent complete three consecutive year calendar of quality assured data. EPA has only made publicly available official design values up to 2012-2014. Based on hourly readings that EPA and TCEQ have posted online, however, the following table lists the anticipated 2013-15 design values for the DFW area.

Table 1 — Projected 2013-2015 Design Values for DFW Area[30]

AQS Site ID	Local Site Name	County	2013 4th Highest Daily Max Value	2014 4th Highest Daily Max Value	2015 4th Highest Daily Max Value	Projected 2013-2015 Design Value

[30] Data derived from https://docs.airnowapi.org/.

481210034	Denton Airport South	Denton	0.085	0.077	0.088	0.083
484391002	Fort Worth Northwest	Tarrant	0.084	0.079	0.079	0.080
481211032	Pilot Point	Denton	0.084	0.075	0.079	0.079
484393009	Grapevine Fairway	Tarrant	0.083	0.073	0.079	0.078
480850005	Frisco	Collin	0.078	0.074	0.077	0.076
484390075	Eagle Mountain Lake	Tarrant	0.077	0.073	0.078	0.076
484392003	Keller	Tarrant	0.080	0.074	0.076	0.076
481130069	Dallas Hinton	Dallas	0.081	0.066	0.08	0.075
481130075	Dallas North #2	Dallas	0.077	0.070	0.078	0.075
483670081	Parker County	Parker	0.074	0.072	0.076	0.075
482510003	Cleburne Airport	Johnson	0.077	0.071	0.069	0.073
483970001	Rockwall Heath	Rockwall	0.073	0.066	0.071	0.070
481130087	Dallas Redbird Airport Executive	Dallas	0.074	0.062	0.073	0.069
481390016	Midlothian OFW	Ellis	0.075	0.062	0.068	0.068
482570005	Kaufman	Kaufman	0.075	0.062	0.064	0.067
484393011	Arlington Municipal Airport	Tarrant	0.068	0.065	0.069	0.067
481391044	Italy	Ellis	0.072	0.060	0.065	0.065

As the Table above makes clear, most (if not all) of the current DFW nonattainment area will also be designated nonattainment under the revised, more stringent 2015 standard.

B. Factor 2: Emissions and Emissions Related Data

In its guidance, EPA notes that sources and levels of emissions of ozone-precursor pollutants are "important factors in the initial designation process." 2016 Guidance, Attach. C at 5. EPA will also evaluate the current emissions data "from nearby counties to assess each county's potential contribution to ozone concentrations at the violating monitors under evaluation." *Id*. While emissions from sources "many hundreds of miles" away are not considered "nearby," EPA has also made clear that states should consider a "relatively broad

geographic area" associated with a monitored evaluation and there is no "bright line" test for determining which emissions to consider. 2016 Guidance at 5; Attach. C at 1, 5. Instead, states should consider the relative magnitude and spatial extent of emissions that may be impacting a particular violation monitor. 2016 Guidance, Attach. C at 5.

EPA has indicated that it will be appropriate to use the 2011 National Emissions Inventory data in making designation because that will be the most recent national emissions inventory information available at the beginning of the designation process. *Id*. at 6. Based on that data, Freestone, Limestone, Rusk, and Titus Counties—the counties in which the Martin Lake, Monticello, Big Brown, Limestone, and Welsh power plants are located—rank among the highest in northeast Texas for NOx and VOC emissions. They rank much higher than all but two of the counties within the DFW Combined Statistical Area ("CSA") that has historically been designated nonattainment, or which TCEQ intends to recommend for nonattainment.

Table 2 —NOx Emissions Contributing Significantly to DFW Area Exceedances of 2015 Ozone NAAQS[31]

County	NOx (tpy)
Dallas	51,073
Tarrant	44,678
Titus	22,741
Rusk	20,678
Limestone	17,593
Freestone	15,189
Denton	13,158
Wise	11,823
Collin	11,712
Ellis	10,747
Johnson	8,326
Parker	5,289
Kaufman	5,185
Hood	3,724
Rockwall	1,920

EPA's 2008 guidance also recommends taking into account "emissions from large stationary sources" that may impact nonattainment for a particular areas. 2016 Guidance, Attach. 3 at 6. As EPA has recognized, the five East Texas coal plants—Martin Lake, Monticello, Big Brown, Limestone, and Welsh—are among the State's largest individual sources of the ozone precursor, nitrogen oxide ("NOx"). Indeed, the coal plants by themselves account for approximately 55% of the point source NOx emissions in the 44-county area of northeast

[31] EPA 2011 National Emissions Inventory, https://www.epa.gov/air-emissions-inventories/2011-national-emissions-inventory-nei-data (emphasis added).

Texas, and approximately 15% of the state's overall point source NOx emissions.[32] This is unsurprising given the lack of modern and more effective NOx controls on these coal-fired power plants. None of the coal boilers at these 5 plants are equipped with Selective Catalytic Reduction ("SCR"), standard end-of-pipe pollution control technology that has been employed in the electric sector for more than 20 years.

As the Table below indicates the five East Texas coal plants emitted more NOx in 2011 than all of the sources in Dallas County, or Tarrant County. In fact, these five power plants alone emit approximately 33% of the NOx emitted by all of the sources in all of the DFW area counties currently designated as nonattainment.

Table 3—2011 NOx Emissions from East Texas Coal Plants[33]

Facility Name	NOx (tons)
Big Brown	5794.482
Limestone	14171.39
Martin Lake	15181.16
Monticello	9235.793
Welsh Power Plant	11096.77
Total	55479.6

By requiring these five plants to update their NOx controls, the state could eliminate thousands of tons of ozone precursors. Between the high levels of ozone precursors emitted by these five sources in Limestone, Freestone, Rusk, and Titus counties, and the minimal NOx controls on their largest sources, the "emissions data" factor weighs heavily towards including these counties in the DFW nonattainment area.

C. Factor 3: Meteorological Data (weather/transport)

The region's air transport patterns also support including Freestone, Rusk, Titus, and Limestone Counties in the DFW nonattainment area for the 2015 ozone NAAQS. There is ample evidence that pollution plumes from the coal plants in these counties travel to the DFW area. Not only have Texas and EPA long recognized the impacts of pollution from the East Texas coal plants, recent source apportionment modeling analyses—applying methodologies that EPA and TCEQ have relied upon—demonstrate clear source-receptor relationships between the East Texas coal plants and DFW monitors. Indeed, separate source apportionment modeling

[32] *See* TCEQ, 2014 Point Source Emissions Inventory, https://www.tceq.texas.gov/airquality/point-source-ei/psei.html; *see also* EPA, Air Markets DataBase, http://ampd.epa.gov/ampd/. According to TCEQ, in 2014, the Limestone plant emitted 12,192 tons of NOx, Martin Lake emitted 11,758 tons, Welsh emitted 7,563 tons, Monticello emitted 5,116 tons, and Big Brown emitted 5,087 tons, for a total of 41,716 tons. All of the remaining point sources in TCEQ Regions 4 & 5, and Freestone and Limestone Counties—where Big Brown and Limestone are located—emitted only 34,424 tons.
[33] *See* EPA, Air Markets Program Data, https://ampd.epa.gov/ampd/.

analyses run by Sonoma Technology, Inc. and the University of North Texas make clear that the East Texas coal plants collectively and individually contribute significantly (*i.e.*, above 1% of the NAAQS) to DFW's nonattainment.

1. EPA and TCEQ Have Long-Recognized That Pollution from the East Texas Coal Plants Contributes to DFW's Nonattainment

EPA and TCEQ have long understood that much of the ozone in the DFW area results from pollution blowing in from other counties. In its February 2015 review of TCEQ's DFW nonattainment SIP proposal for the 2008 ozone standard,[34] for example, EPA staff recognized the large role of coal plants in DFW's chronic ozone nonattainment problem.[35] Indeed, EPA observed that TCEQ's "background and transport analyses show that efforts focused solely on controlling local emissions may be insufficient to bring the DFW area into ozone attainment given that, on many days, background estimates are well over half the eight-hour ozone NAAQS of 75 ppb." EPA then concluded that TCEQ's own discussion of the formation, background levels, and transport of ozone "strongly supports the implementation of controls on NOx sources located to the east and southeast of the DFW nonattainment area."[36]

Similarly, TCEQ's own source-apportioned modeling has demonstrated the significant contribution of the coal-fired EGUs in eastern Texas on DFW's persistent nonattainment problems.[37] Indeed, TCEQ's own 2009 source apportionment modeling demonstrated that NOx emissions from the coal-fired EGUs at Martin Lake, Monticello, Limestone, Welsh, and Big Brown were responsible for between 1.0 and 1.5 ppb impact at the nonattaining Midlothian and Arlington monitors in the DFW area.

Moreover, that modeling demonstrated a clear relationship between DFW episodes and the East Texas coal plants. Several ozone monitors included in TCEQ's analysis were located around the perimeter of the DFW nonattainment area. When ozone is high along one or more perimeter monitors, it suggests that high ozone concentrations and precursors are being transported into the DFW area (in other words, are not from local pollution sources). For example, during a high ozone episode on June 5, 2009, TCEQ determined, based in part on information from the Italy monitor, that "regional background levels of ozone coming into the DFW area were around 62 to 66 ppb."[38]

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[34] Proposed Dallas-Fort Worth 2008 Eight-Hour Ozone Nonattainment Area Demonstration ("AD") State Implementation Plan ("SIP") Revision, SIP Project No. 2013-015-SIP-NR.
[35] Ex. 2 (EPA, Comments Re: Revisions to Dallas-Fort Worth Attainment Demonstration for the 2008 Eight-Hour Ozone Nonattainment Area, Project Number 2013-015-SIP-NR (Feb. 11, 2015) [hereinafter, "EPA Comments DFW AD SIP"]).
[36] *Id*. at 2.
[37] Tai et al., Task 19, DFW APCA Run for 2009 with East Texas EGU Controls, Environ (June 22, 2006), attached as Ex. 3.
[38] *See* Dallas Fort Worth High Ozone June 5, 2009, at http://www.tceq.texas.gov/airquality/monops/air-pollution-events/2009/dallas-fort-worthhigh-ozone-june-5-2009 (also including plume animations); Italy C1044/A323 (monitor information page), at http://www.tceq.state.tx.us/cgibin/

2. The University of North Texas's 2015 Source Apportionment Modeling Demonstrates Significant Contribution from the East Texas Coal Plants

As noted, in its December 2015 review of TCEQ's DFW nonattainment SIP proposal for the 2008 standard,[39] explicitly recognized the contribution from the East Texas coal plants to DFW's nonattainment and requested that TCEQ reevaluate the benefits to the DFW area associated with reducing NOx emission "from utility electric generators in just the counties closest to the eastern and southern boundaries of the DFW area."[40]

TCEQ never responded to that request. Nor did it perform any analysis to estimate the contribution from the East Texas coal plants to DFW's nonattainment. But the University of North Texas ("UNT") Engineering Department did.

In a 2015 study, UNT cloned the State's DFW computer air model used for TCEQ's 2008 ozone NAAQS DFW SIP and ran control scenarios the State declined to do.[41] The UNT model essentially replicates the photochemical modeling analysis (*i.e.*, the Anthropogenic Precursor Culpability Assessment and Ozone Source Apportionment Technology (OSAT) model) that TCEQ used for the proposed 2008 ozone NAAQS DFW nonattainment SIP revision using TCEQ's own inputs.[42] In particular, the modeling measured the reductions in ozone that would be associated with the installation of emission controls, such as SCR, or the imposition of a mass-based emission limitation at the East Texas coal plants. The UNT model makes clear that no other single control option improves DFW ozone levels as significantly as reducing NOx pollution from the East Texas coal plants.

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compliance/monops/site_photo.pl?cams=1044.

[39] Proposed Dallas-Fort Worth 2008 Eight-Hour Ozone Nonattainment Area Demonstration ("AD") State Implementation Plan ("SIP") Revision, SIP Project No. 2013-015-SIP-NR.

[40] *Id*. at 2.

[41] Drs. Mahdi Ahmadi and Kuruvilla John, North Texas Ozone Attainment Initiative Project, (Nov. 2015), *at* http://dfwozonestudy.org/.

[42] The TCEQ used the Comprehensive Air quality Model with extensions (CAMx) version 6.10 (with patch 1) (Environ, 2014), with a plume-in-grid sub-model. *See* App'x C, Photochemical Modeling for the DFW Attainment Demonstration SIP Revision for the 2008 Eight-Hour Ozone Standard, https://www.tceq.texas.gov/assets/public/implementation/air/sip/dfw/dfw_ad_sip_2015/AD/Adoption/DFW_SIP_Appendix_C_060315.pdf.

90% NOx reduction from the coal-fired EGUs

Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells nearby CAMS (Scenario – FY18)

CAMS	Scenario A 67-day episode
Kaufman - C71	6.5
Dallas Hinton St. - C401	5.7
Arlington - C61	5.7
Grapevine - C70	5.7
Greenville - C1006	5.5
Dallas Exec. Airport - C402	5.3
Itally/Ellis - C650	5.3
Midlothian OFW - C52	5.3
Rockwall - C69	4.9
Midlothian Tower - C94	4.9
Dallas North - C63	4.7
Denton Airport South - C56	4.6
Keller-C17	4.5
Frisco - C31	4.4
Cleburne Airport - C77	4.4
Granbury - C73	4.1
Pilot Point - C1032	4.0
Ft. Worth Northwest-C13	3.7
Parker County - C76	3.6
Eagle Mt. Lake - C75	3.4

Table 4—Predicted Difference in Modeled Impacts from 90% NOx Reductions from Martin Lake, Monticello, Big Brown, Limestone, and Welsh

As indicated in the figure above, a 90% reduction in NOx emissions from the five East Texas coal plants results in ozone reductions of at least 3 ppb at *all* 20 DFW monitoring sites, and more than 4 ppb improvement at the notoriously failing Denton monitor. *See* North Texas Ozone Attainment Initiative Project Preliminary Project Results, Nov. 6, 2015, attached as Ex. 4, at Slide 11. As the modeling makes clear, the East Texas coal plants have an impact far greater than 0.70 ppb—exceeding EPA's threshold for significance—at all monitors. This includes the Denton Airport South monitor which TCEQ's modeling indicated will be in nonattainment in 2017. It also includes the Grapevine monitor No. 484393009, which EPA's modeling analysis for the Transport Rule Update indicates will be in nonattainment in 2017. *See* 80 Fed. Reg. 46,271, 46,274 (Aug. 4, 2015).[43]

As indicated in the figure below, eliminating NOx emissions at those five coal plants, yields even greater benefits across the DFW nonattainment area.

[43] We believe that Tarrant County Monitor No. 484392003 is listed as the Ft. Worth Northwest monitor in the Table above. This would be an additional monitor which EPA predicts will be in nonattainment in 2017 and for which the East Texas Five contribute more than 0.75 ppb.

100% NOx reduction from the coal-fired EGUs

Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells nearby CAMS (Scenario – FY18)

CAMS	Scenario B 67-day episode
Kaufman - C71	7.7
Rockwall - C69	6.5
Greenville - C1006	6.5
Itally/Ellis - C650	6.3
Arlington - C61	6.1
Dallas Hinton St. - C401	5.6
Midlothian OFW - C52	5.5
Dallas Exec. Airport - C402	5.3
Midlothian Tower - C94	5.2
Cleburne Airport - C77	4.9
Granbury - C73	4.9
Grapevine - C70	4.8
Frisco - C31	4.6
Dallas North - C63	4.4
Parker County - C76	4.1
Pilot Point - C1032	4.1
Eagle Mt. Lake - C75	4.0
Denton Airport South - C56	3.9
Ft. Worth Northwest-C13	3.8
Keller-C17	3.5

Table 5—Predicted Difference in Modeled Impacts from 100% NOx Reductions from Martin Lake, Monticello, Big Brown, Limestone, and Welsh

Although the above scenario evaluate the effect of a 100% reduction, or "zeroing out," of NOx emissions from the five East Texas coal plants, s*ee* Ex. 4 at Slide 20, it shows that those five East Texas coal plants significantly contribute, that is contribute more than 0.70 ppb, to all monitors. Furthermore, again the change predicted by using the relative response factor is greater than 0.70 ppb, that is significant, at all monitors.

The UNT model replicating TCEQ's own model demonstrates that the East Texas coal plants contribute significantly—that is, more than EPA's 1% contribution threshold—to the DFW area's nonattainment with the revised 2015 ozone NAAQS. Accordingly, TCEQ should also include the nearby areas surrounding Big Brown, Martin Lake, Monticello, and Limestone power plants in its proposed nonattainment designation for the 2015 standard.

3. Source Apportionment Modeling for the 2015 Ozone NAAQS Confirms that the Martin Lake, Monticello, and Big Brown Coal Plants Contribute Significantly to Nonattainment in DFW both Collectively and Individually

In 2015, Sonoma Technology, Inc. ("STI") also performed source apportionment modeling using the Comprehensive Air Quality Model with Extensions ("CAMx") (version 6.1) (ENVIRON International Corporation, 2014) with Ozone Source Apportionment Technology ("OSAT") to support the Sierra Club and state air agencies in evaluating ozone impacts from coal fired power plants and other emission sources on downwind receptors in non-attainment areas. The source apportionment modeling was conducted for the 2011 ozone season (May to September) for a domain covering the continental United States at 12-km spatial resolution, and results were compiled into a series of databases that can be used for future data mining and

analysis. The modeling domain and configurations used were based on those developed by EPA in recent ozone transport assessments using CAMx OSAT, and included the use of the carbon-bond 6 revision 2 gas phase chemistry mechanism.

EPA's CAMx is a publically available, peer-reviewed and widely-used state-of-the-science three-dimensional grid-based photochemical air quality model designed to simulate the emission, transport, diffusion, chemical transformation, and removal of gaseous and particle pollutants in the atmosphere over spatial scales ranging from continental to urban. CAMx was designed to approach air quality as a whole by including capabilities for modeling multiple air quality issues, including tropospheric ozone, fine particles, visibility degradation, acid deposition, air toxics, and mercury. The ability of photochemical grid models such as CAMx to treat a large number of sources and their chemical interactions makes them well suited for assessing the impacts of natural and anthropogenic emissions sources on air quality.

CAMx is widely used to support regulatory air quality assessments and air quality management policy decisions in the United States. Indeed, this is the very same modeling platform that TCEQ relied upon to develop its 2008 ozone NAAQS DFW nonattainment SIP revision using TCEQ's own inputs, and that UNT subsequently used to develop its modeling scenarios for the reduction of NOx at the East Texas coal plants.[44] Additional details on the models, data, and methods used can be found in Exhibit 5.

Sierra Club used the results from STI's source apportionment modeling to analyze impacts of emissions from the Martin Lake, Monticello, and Big Brown coal-fired power plants in Rusk, Titus, and Freestone Counties on air quality monitor locations in the DFW area. In summary, the modeling results showed that emissions from those three plants contribute significantly to ozone formation downwind in the DFW area during the 2011 ozone season.

a. Big Brown, Martin Lake, and Monticello Collectively Contribute Significantly to DFW's Nonattainment with the 2015 ozone NAAQS

STI's independent source apportionment modeling for the 2015 Ozone NAAQS confirms that the Martin Lake, Monticello, and Big Brown coal-burning power plants contribute significantly to exceedances of the 2015 ozone standard in the DFW area. These three plants, as a group, modeled daily 8-hr average ozone impacts that were as large as 2.99 ppb at DFW monitors, and were significant (*i.e.*, greater than 0.70 ppb) on as many as 49 days at a single monitor—more than 32% of the modeled days of the year.[45] Together, these three plants

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[44] The TCEQ used the Comprehensive Air quality Model with extensions (CAMx) version 6.10 (with patch 1) (Environ, 2014), with a plume-in-grid sub-model. *See* App'x C, Photochemical Modeling for the DFW Attainment Demonstration SIP Revision for the 2008 Eight-Hour Ozone Standard, https://www.tceq.texas.gov/assets/public/implementation/air/sip/dfw/dfw_ad_sip_2015/AD/Adoption/DFW_SIP_Appendix_C_060315.pdf.

[45] As discussed above, modeled 8-hr ozone impacts greater than 1% of the NAAQS (*i.e.*, 0.70 ppb) should be considered "significantly contributing" to DFW's nonattainment for the purposes of Sectrion 107(d)(1)(A)(i). This 1% significance threshold is consistent with how EPA has

contributed significantly to ozone in the DFW nonattainment area on 61 of 152 modeled days of the year—*i.e.*, more than 40% of the time.

Table 6—Modeled 8-hr average ozone impacts and number of days with significant (i.e., greater than 0.70 ppb) modeled 8-hr average ozone impacts at DFW monitors due to Martin Lake, Monticello, and Big Brown during the 2011 ozone season, ranked by peak modeled impact. Only monitors with a significant modeled impact are shown.[46]

AQS Site ID No.	Monitor Name	County	Maximum Modeled Contribution (ppb)	Number of Significant Days
482311006	Greenville	Hunt	2.99	30
481391044	Italy	Ellis	2.62	20
482570005	Kaufman	Kaufman	2.56	49
483970001	Rockwall Heath	Rockwall	2.39	27
481390016	Midlothian OFW	Ellis	2.10	14
481211032	Pilot Point	Denton	1.90	12
482510003	Cleborne Airport	Johnson	1.83	7
484393009	Grapevine Fairway	Tarrant	1.62	11
481210034	Denton Airport South	Denton	1.59	11
480850005	Frisco	Collin	1.53	13
481130087	Dallas Redbird Airport	Dallas	1.46	13
484393011	Arlington Municipal Airport	Tarrant	1.40	11
481130075	Dallas North #2	Dallas	1.35	12
484392003	Keller	Tarrant	1.32	6
481130069	Dallas Hinton	Dallas	1.30	11
484391002	Fort Worth Northwest	Tarrant	1.24	4
484390075	Eagle Mountain Lake	Tarrant	1.23	6
483670081	Parker County	Parker	1.03	5

consistent defined as significant contributions for ozone and PM. *See* 76 Fed. Reg. 80760 (Dec. 27, 2011) (final Cross State Air Pollution Rule); 75 Fed. Reg. 45210, 45232-37 (Aug. 2, 2010) (explaining application of one percent significance threshold in proposed Cross-State Air Pollution Rule); 70 Fed. Reg. at 25193 (Clean Air Interstate Rule); 63 Fed. Reg. at 57379-80 (NOx SIP Call).

[46] *See* Ex. 6 at Combined Impacts Data tab.

Moreover, the modeling demonstrates that Martin Lake, Monticello, and Big Brown significantly contributed (*i.e.*, more than 0.70 ppb) to *at least 51 days during which DFW area monitors showed exceedances* of the 2015 ozone standard.[47]

b. Martin Lake Significantly Contributes to Exceedances of the 2015 ozone NAAQS in DFW

For Martin Lake, modeled daily 8-hr average ozone impacts were as large as 1.99 ppb at DFW monitors, and were significant (*i.e.*, greater than 0.75 ppb) on as many as 6 days at a single monitor.[48]

Table 7—Modeled 8-hr average ozone impacts and number of days with significant (i.e., greater than 0.70 ppb) modeled 8-hr average ozone impacts at DFW monitors due to Martin Lake during the 2011 ozone season, ranked by peak modeled impact. Only monitors with a significant modeled impact are shown[49].

AQS Site	Monitor Name	County	Maximum Modeled Contribution (ppb)	Number of Significant Days
482570005	Kaufman	Kaufman	1.99	6
482311006	Greenville	Hunt	1.48	6
483970001	Rockwall Heath	Rockwall	1.47	5
481390016	Midlothian OFW	Ellis	1.32	2
481391044	Italy	Ellis	1.10	3
481211032	Pilot Point	Denton	1.01	2
484393011	Arlington Municipal Airport	Tarrant	0.95	1
481130087	Dallas Redbird Airport	Dallas	0.92	2
481210034	Denton Airport South	Denton	0.89	1
480850005	Frisco	Collin	0.87	1
484393009	Grapevine Fairway	Tarrant	0.85	1
482510003	Cleborne Airport	Johnson	0.79	2
484392003	Keller	Tarrant	0.76	1
484390075	Eagle Mountain Lake	Tarrant	0.74	1
484391002	Fort Worth	Tarrant	0.73	1

[47] *See* Ex. 6, Combined Impacts on DFW tab, Column P. For days where a particular monitor is not functioning properly, the model reflects "N/A."
[48] *See supra*, note 45.
[49] *See* Ex. 6, Martin Lake Impacts tab.

	Northwest			
481130075	Dallas North #2	Dallas	0.73	2
483670081	Parker County	Parker	0.71	1
481130069	Dallas Hinton	Dallas	0.71	1

Moreover, on several days during the 2011 ozone season, the model demonstrates significant impacts (*i.e.*, greater than 1% of the NAAQS) from Martin Lake contributed to several actual exceedances of the 2015 ozone standard at one or more of the DFW area monitors.[50]

Table 8— Modeled 8-hr ozone impacts from Martin Lake exceeding 1% of the 2015 ozone NAAQS (i.e., greater than 0.70 ppb) on days when the NAAQS was exceeded, sorted by date.[51]

AQS Site	**Monitor Name**	**County**	**Date**	**Maximum Modeled Contribution (ppb)**	**Real Monitor Daily 8-hour Concentration**
480850005	Frisco	Collin	8/27/2011	0.87	78
481211032	Pilot Point	Denton	8/27/2011	0.81	79
481130075	Dallas North #2	Dallas	8/27/2011	0.71	88
481211032	Pilot Point	Denton	8/28/2011	1.01	92
481210034	Denton Airport South	Denton	8/28/20111	0.89	98
484392003	Keller	Tarrant	8/28/2011	0.76	103
484390075	Eagle Mountain Lake	Tarrant	8/28/2011	0.74	85
484391002	Fort Worth Northwest	Tarrant	8/28/2011	0.73	87
482510003	Cleburne Airport	Johnson	8/28/2011	0.72	82
483670081	Parker	Parker	8/28/2011	0.71	93
482510003	Cleburne Airport	Johnson	9/26/2011	0.79	76

c. Source Apportionment Modeling Demonstrates that Big Brown Contributes Significantly to Exceedances of the 2015 NAAQS in DFW

For Big Brown, modeled daily 8-hr average ozone impacts were as large as 2.11 ppb at the Kaufman monitors, and were significant (*i.e.*, greater than 0.75 ppb) 30 days—nearly 20% of

[50] *See* Ex. 6, Martin Lake Impacts on DFW tab, Column P.
[51] *See id.*

the season—at that single monitor.[52] Significant ozone impacts were modeled at one or more DFW monitors on 28% of modeled days (43 out of 152) during the ozone season.

Table 9—Modeled 8-hr average ozone impacts and number of days with significant (i.e., greater than 0.70 ppb) modeled 8-hr average ozone impacts at DFW monitors due to Big Brown during the 2011 ozone season, ranked by peak modeled impact. Only monitors with a significant modeled impact are shown.[53]

AQS Site	**Monitor Name**	**County**	**Maximum Modeled Contribution (ppb)**	**Number of Significant Days**
482570005	Kaufman	Kaufman	2.11	30
481391044	Italy	Ellis	1.60	11
482311006	Greenville	Hunt	1.44	16
483970001	Rockwall Heath	Rockwall	1.34	10
481130069	Dallas Hinton	Dallas	1.10	3
481130075	Dallas North #2	Dallas	1.04	3
481130087	Dallas Redbird Airport	Dallas	1.03	1
484393009	Grapevine Fairway	Tarrant	0.91	1
480850005	Frisco	Collin	0.88	2
484393011	Arlington Municipal Airport	Tarrant	0.81	1
481390016	Midlothian OFW	Ellis	0.81	2
482510003	Cleborne Airport	Johnson	0.78	1
481210034	Denton Airport South	Denton	0.72	1

d. Monticello Also Contributes Significantly to Exceedances of the 2015 Ozone Standard in DFW

For Monticello, modeled daily 8-hr average ozone impacts were as large as 1.96 ppb at the Greenville monitor, and were significant (*i.e.*, greater than 0.75 ppb) 30 days—nearly 20% of the season—at that single monitor.[54] Significant ozone impacts were modeled at one or more DFW monitors on 28% of modeled days (43 out of 152) during the ozone season.

Table 10—Modeled 8-hr average ozone impacts and number of days with significant (i.e., greater than 0.70 ppb) modeled 8-hr average ozone impacts at DFW monitors due to Monticello

[52] *See supra*, note 45.
[53] *See* Ex. 6, Big Brown Impacts Data tab.
[54] *See supra*, note 45.

during the 2011 ozone season, ranked by peak modeled impact. Only monitors with a significant modeled impact are shown.[55]

AQS Site	Monitor Name	County	Maximum Modeled Contribution (ppb)	Number of Significant Days
482311006	Greenville	Hunt	1.96	5
482570005	Kaufman	Kaufman	1.90	3
481391044	Italy	Ellis	1.26	2
480850005	Frisco	Collin	1.04	1
483970001	Rockwall Heath	Rockwall	0.99	6
481130075	Dallas North #2	Dallas	0.82	1
484393009	Grapevine Fairway	Tarrant	0.75	1
481390016	Midlothian OFW	Ellis	0.74	1

As multiple source apportionment models have now demonstrated, Martin Lake, Monticello, Big Brown, Limestone, and Welsh—both individually and collectively—contribute significantly to ozone levels in the DFW area. Records of 2013-2015 wind patterns from the Corsicana Airport and Longview, Texas further confirm that the prevailing winds are consistently from the south and southeast, which would carry pollution from Big Brown and Limestone, and other sources in the East Texas counties to the DFW nonattainment area. Ex. 7 (wind rose plots). Accordingly, TCEQ must, at a minimum, include those sources in the DFW nonattainment area for the 2015 ozone NAAQS.

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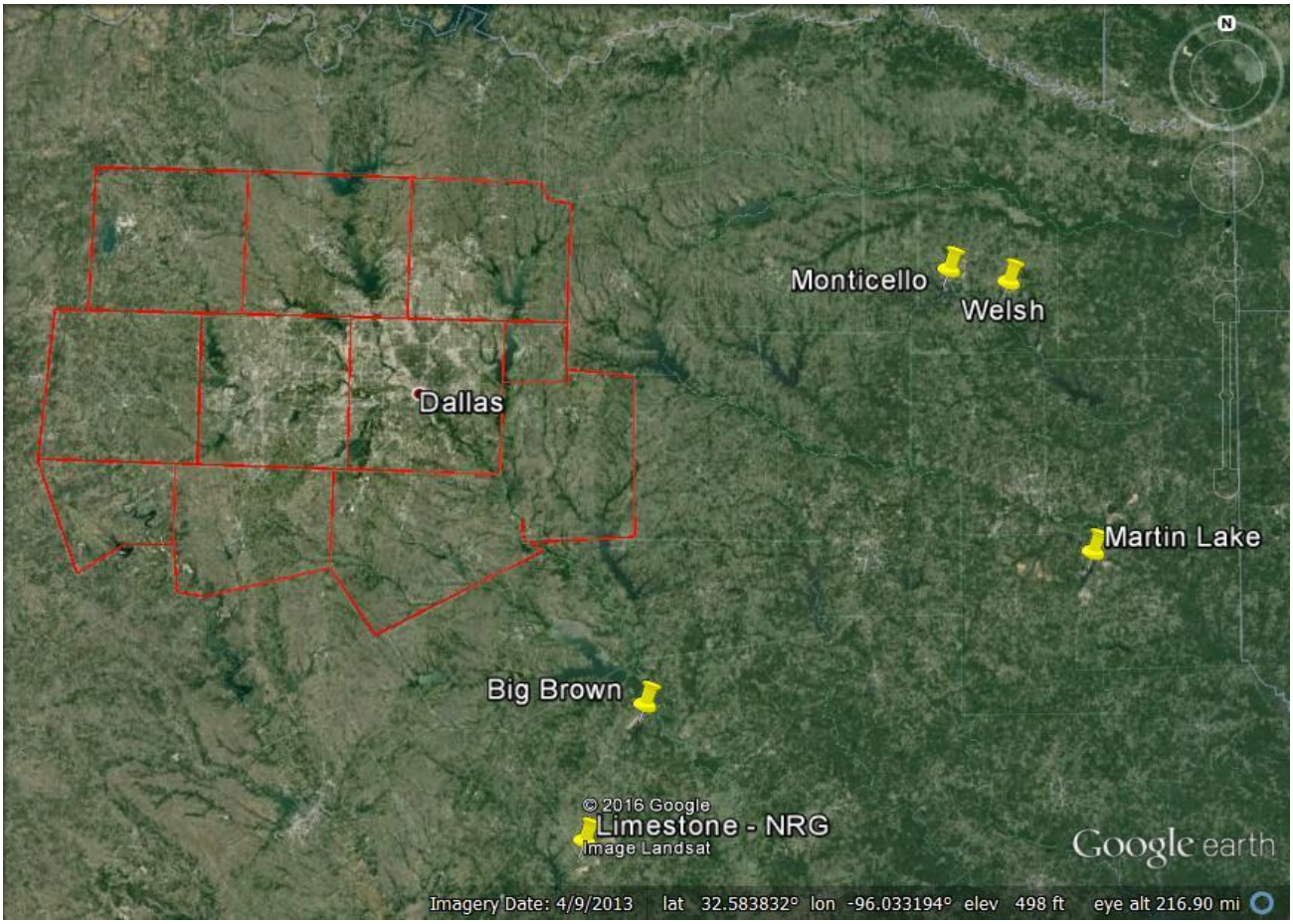
D. Factor 4: Geography/Topography (mountain ranges or other air basin boundaries)

Ground-level ozone and ozone precursor emissions in Texas are readily transported. Neither the DFW area nor the areas between DFW and nearby Freestone, Rusk, Titus, and Limestone Counties have any geographical or topographical barriers significantly limiting air pollution transport.

Figure 7 below shows a map of the East Texas coal plants (yellow pins) in relation to the Dallas-Fort Worth area. The Martin Lake coal plant in Rusk County is approximately 120 miles from Dallas, while Monticello and Welsh are each approximately 95-100 miles away, Limestone is approximately 85 miles away, and Big Brown is 70 miles from Dallas. While the power plants and the counties they are located in are not contiguous with the current DFW nonattainment area, they are "nearby" for the purposes of Section 107(d)(1) of the Clean Air Act. As discussed above, these sources exceed EPA's threshold for significant contribution to DFW's nonattainment with the 2015 ozone standard.

[55] *See* Ex. 6, Monticello Impacts Data tab.

Figure 7—Satellite Image of Proposed DFW Nonattainment Area with East Texas Coal Plants



Although the counties in which the East Texas coal plants are located are not adjacent to the existing DFW nonattainment area, that fact is not a valid reason for TCEQ to omit them from its analysis, particularly when TCEQ has considered and relied upon emission reductions from even greater distances to achieve compliance with the NAAQS. In seeking approval of a State Implementation Plan revision for the DFW nonattainment area, for example, Texas relied upon emissions reductions from a plant in Milam County—more than 120 miles south of the DFW nonattainment area—to demonstrate compliance with the 1997 ozone NAAQS. *See* 71 Fed. Reg. 48870, 48875 (Aug. 22, 2006). Milam County is further away from DFW than any of the East Texas coal plants, and EPA approved Texas's SIP, which claimed these reductions demonstrated progress towards reaching attainment. It would be arbitrary and irrational for the state to take credit for emissions reductions in emissions in Milam County—more than 120 miles from DFW—for the purpose of complying with the NAAQS, but at the same time, refuse to recognize that the five East Texas coal plants—which are even closer to DFW—contribute significantly to DFW's air quality problems.

E. Factor 5: Jurisdictional Boundaries

EPA's guidance provides that "[o]nce the geographic extent of the violating area and the *nearby* area[s] contributing to violations is determined, existing jurisdictional boundaries may be considered for the purposes of providing a clearly defined legal boundary and carrying out the air quality planning and enforcement functions for nonattainment areas." 2016 Guidance, Attach. 1 at 10 (emphasis added). While EPA provides examples of traditional jurisdictional boundaries, such as existing nonattainment areas or counties in Combined Statistical Areas, EPA's guidance does not preclude the designation of noncontiguous areas that are contributing to nonattainment. As noted, EPA's guidance makes clear that it is "important to examine ozone-contributing emissions across a *relatively broad* geographic area associated with a monitored violation." EPA 2016 Guidance at 5 (emphasis added). And Section 107(d) of the Clean Air Act explicitly requires that EPA designate as nonattainment not only the area that is violating the pertinent standard, but also those nearby areas that contribute to the violation. As demonstrated by multiple source-apportionment modeling exercises, using the same modeling methodologies used by EPA and TCEQ, the East Texas coal plants in Freestone, Rusk, Titus, and Limestone Counties far exceed the 1% contribution threshold that EPA has relied upon to find "significant contribution" in other contexts.[56] In light of the significant contribution of the East Texas coal plants to the DFW's ozone nonattainment, TCEQ should designate the counties surrounding those plants as being in nonattainment with the 2015 ozone NAAQS, notwithstanding the fact that they are not contiguous with the jurisdictional boundaries of the current DFW nonattainment area.

F. TCEQ Should Include the East Texas Coal Plants in the DFW Nonattainment Area

As discussed, the fact that the East Texas coal plants are not in areas contiguous with the existing DFW nonattainment area is not a valid reason for TCEQ to omit them from its analysis, particularly when the factors pointing towards inclusion are so strong. EPA has designated noncontiguous areas as belonging to the same urban nonattainment area where the contributions from a large stationary source contributed sufficiently to nonattainment. *Catawba County*, 571 F.3d at 41-43. Although that case addressed the NAAQS for fine particulate matter, the same principle should apply here.

Available data on emissions and meteorology strongly indicate that the large sources of ozone precursor pollutants in Freestone, Limestone, Rusk, and Titus Counties are significantly contributing to DFW's difficulty in meeting health based standards for ozone pollution. To ensure that all of the parties contributing DFW nonattainment are on a level playing field and to avoid undermining other efforts to reduce air pollution in the DFW area, TCEQ must include these noncontiguous counties in the DFW nonattainment area. Currently, nearly all of the major stationary sources of NOx within the existing nonattainment area have been controlled, yet Dallas still has problems meeting the 2008 75 ppb ozone standard—let alone the more stringent 2015 70 ppb standard.

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[56] *See, e.g.*, Cross State Air Pollution Rule, 76 Fed. Reg. 80760 (Dec. 27, 2011)

DFW's difficulties meeting these health-based standards are clearly caused by ozone pollution from nearby regional sources, such as the East Texas coal plants, yet TCEQ has repeatedly ignored the impacts from these sources. We urge TCEQ to include the East Texas coal plants in the DFW nonattainment area.

IV. SAN ANTONIO-NEW BRAUNFELS MSA OZONE NONATTAINMENT DESIGNATION COMMENTS FOR THE 70 PPB NAAQS

Sierra Club supports TCEQ's proposal to designate Bexar County as being in nonattainment with the 2015 ozone NAAQS. In addition to designating Bexar County, there are legitimate reasons to include seven additional counties as part of the proposed nonattainment area for the San Antonio-New Braunfels Metropolitan Statistical Area.

A. San Antonio Air Monitors Three-Year Average Ozone Levels in Violation of EPA's 70 ppb NAAQS Threshold

San Antonio and Bexar County exceeded the new federal ozone standard during the previous three years (2013-15) at two San Antonio, Bexar County ozone monitors at Camp Bullis C58 and San Antonio NW C23. The Camp Bullis C58 monitor had a 78 ppb three-year average in northern Bexar County and San Antonio NW C23 monitor had a 74 ppb three-year average in northern Bexar County. The two Bexar County monitors are in violation of the EPA's standard 3-year average of 70 ppb.[57]

The sudden and dramatic development in recent years of the oil and gas industry using fracking technology in Wilson County and nearby counties like Karnes has resulted in releasing significant air pollution and ozone precursors that have been triggering higher ambient ozone in San Antonio area monitors starting in 2009-2010, but there were no minor source oil and gas facility emissions inventories at the time in upwind areas such as Wilson and like Karnes County to fully assess these impacts on San Antonio's air quality.[58] Since the prevailing winds are typically from the south and southeast, the potential is obvious for the Eagle Ford Shale oil and gas activities to cause downwind ozone increases in the San Antonio area with at least a few part per billion ozone higher in hourly concentrations during the day time periods when ozone is observed at its highest levels.

Generally the San Antonio area monitors were indicating declining ozone after the year 2000 and the area's emissions inventory (EI) supported that trend. Thousands of new oil and gas wells in Wilson and Karnes Counties have caused large amounts of new air pollution to drift into San Antonio. Spiking levels of ozone have continued with the rising oil and gas drilling and tracking activities in these upwind counties. Indeed the EI reports by the San Antonio AACOG indicate the significant levels of industrial air pollution associated with the oil and gas activities in the upwind counties to the south and southeast of San Antonio.[59]

In reviewing current ozone data in 2016, San Antonio and Bexar County already have one ozone monitor that exceeded the three-year average in 2014-16 with a 71 ppb average at

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[57] http://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=report.site_list.
[58] https://www.aacog.com/index.aspx?nid=97.
[59] *Id*.

the Camp Bullis C58 monitor. This three-year average violation occurred one week into the 2016 ozone season, and the Camp Bullis three-year average of 71 ppb will likely rise as ozone concentrations increase this summer.

The San Antonio's area ozone season began April 1st (and is lengthy at seven months since it continues through October 31) and ozone is the most prevalent air pollutant in the San Antonio region based on ambient air monitoring data. By April 8, 2016, the new EPA standard of 70 ppb was exceeded based on the average for the most recent three-year period (2014-16). The San Antonio area surpassed the three-year average threshold of 70 ppb when 61 ppb was measured as the fourth highest average daily ozone reading of 2016 at the Camp Bullis C58 regulatory monitor. Camp Bullis has a three-year average at 71 ppb in 2014-2016 versus the 2013-15 three-year average of 78 ppb, and the current ozone season has just begun meaning the Camp Bullis site will likely end up higher than a 71 ppb 3-year average in 2014-16.

B. Given the Explosive Growth in Population and Oil and Gas Extraction Activities, the Bexar Nonattainment Area Should Be Expanded

In 2011, based on the area's growth in population in the outlying counties, the San Antonio MSA was expanded from four to eight counties by the federal Office of Management and Budget, and it was renamed the San Antonio-New Braunfels MSA.[60] The San Antonio-New Braunfels MSA is also called the Greater San Antonio area. The San Antonio-New Braunfels MSA consists of eight counties clustered around San Antonio and Bexar County: Atascosa, Bandera, Bexar, Comal, Guadalupe, Kendall, Medina and Wilson counties. The San Antonio-New Braunfels MSA is experiencing significant growth and increasing commuter traffic from growing cities like New Braunfels north of San Antonio. Moreover, the city of New Braunfels, the second-largest city in South Central Texas, is part of the newly expanded and renamed San Antonio-New Braunfels MSA, which has grown from four to eight counties. The significant San Antonio-New Braunfels MSA population growth result is that ozone will become an increasing concern in the San Antonio-New Braunfels MSA as reflected in the hourly and 8-hour ozone readings in the area.

The San Antonio-New Braunfels MSA is now the third largest metropolitan area in Texas with 2.1 million in the 2011 census reaching nearly 2.4 million in 2015, and is the second fastest growing after the Austin area, which both indicate that urban and regional air pollution, including ground level ozone, are likely to become an increasing public health concern as traffic congestion and sprawl become a serious concern coupled with industrial plant emissions throughout the 8-county MSA region from Portland Cement Kilns, coal-fired power plants, and other major sources. For example, the 8-county area has sixty major point sources and hundreds of minor oil and gas facilities in the Eagle Ford Shale that are not listed by the TCEQ: Bexar - 33, Atascosa - 2, Bandera - 1, Comal - 6, Guadalupe - 9, Kendall - 1, Medina - 0, and Wilson - 8.[61] But an Eagle Ford Shale emissions inventory projects a large growth in annual ozone precursors between 2012-2018.

Additionally, a San Antonio Alamo Area Council Of Governments ("AACOG") report

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[60] S.A.'s metro area growing, San Antonio Express News (May 2, 2011), http://www.mysanantonio.com/news/local_news/article/S-A-s-metro-area-growing-1361131.php

[61] at: https://www.tceq.texas.gov/airquality/point-source-ei/psei.html.

cites that the combined annual ozone precursors jump from 483 tons in 2012 up to as high as 2,598 tons in 2018.[62] As the report emphasizes:

> [p]roduction in the Eagle Ford emitted 193 tons of NOX and 310 tons of VOC per ozone season day in 2012 (Table 4-1). NOX emissions increase slightly for the low development scenario in 2018 (219 tons per day). NOX emissions also increase under the 2018 moderate scenario (302 tons per day) and the high scenario (423 tons per day). By 2018, VOC emissions are expected to increase significantly to 689 tons per ozone season day under the low development scenario and to 1,248 tons per ozone season day under the high development scenario.[63]

Another reason to designate the San Antonio-New Braunfels MSA as an ozone nonattainment area, as partly explained and supported by AACOG's EI data, is that the Eagle Ford Shale is most likely having an impact on ozone formation downwind in the San Antonio area and Wilson County would be part of the new San Antonio-New Braunfels nonattainment area to help address these industrial air quality impacts. Without including counties like Wilson in a new San Antonio-New Braunfels nonattainment area, this exclusion would negate certain ozone control efforts in the other downwind counties.

V. CONCLUSION

Because the available emissions and meteorological data demonstrate that the five East Texas coal-fired power plants contribute significantly to exceedances of the 2015 ozone NAAQS in the DFW area, we urge TCEQ to include the areas surrounding each of those nearby plants in its proposed nonattainment designation for the DFW. Similarly, **we urge TCEQ to include** Atascosa, Bandera, Bexar, Comal, Guadalupe, Kendall, Medina and Wilson counties in the proposed nonattainment area designation for the San Antonio area.

Sincerely,

Joshua Smith
Staff Attorney
Sierra Club
85 Second Street, 2nd Floor
San Francisco, CA 94105

[62] AACOG report: Conceptual Model, Ozone Analysis of the San Antonio Region, Updates through Year 2014 Technical Report (Oct. 23, 2016), http://www.aacog.com/index.aspx?NID=98.
[63] *Id*. at 42.

Health Effects Prevented by a 5 ppb Drop in Ozone Levels:

The Expectation from Retrofitting or Closing 5 East Texas Coal-Fired Power Plants

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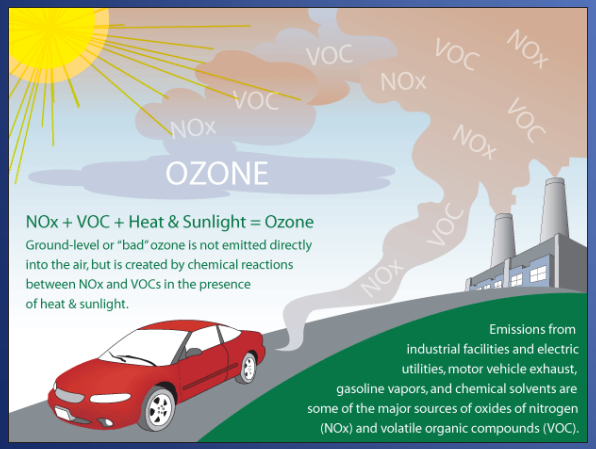
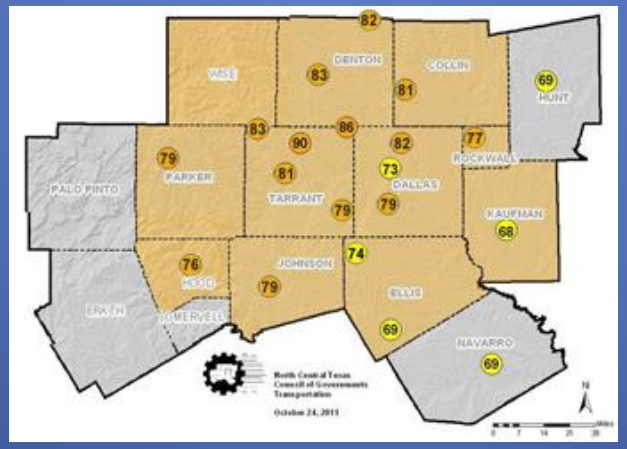
Martha Carvour, M.D., Ph.D.
Division of Epidemiology
Department of Internal Medicine
University of Texas Southwestern Medical Center

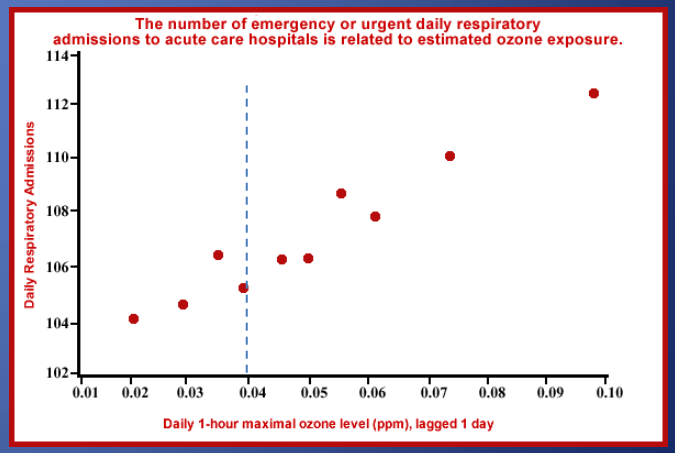
Sierra Club Ex. 1

Background

- Ground-level ozone is formed when NO_x emissions from coal burning combines with VOCs from automobile exhaust, catalyzed by sunlight (left figure).
- The current EPA standard is a "design value"* of 75 ppb, will soon drop to 70 ppb.
- The 10 counties around DFW have not "attained" the standard in 25 years (middle fig).
- The current design value of DFW 10-county non-attainment area is 83 ppb.
- Respiratory exacerbations, heart attacks and death increase with ozone level.
- These health effects continue to occur down at least to 40 ppb—the "non-anthropogenic range" (right figure where ozone level is in ppm: 0.04 ppm = 40 ppb)

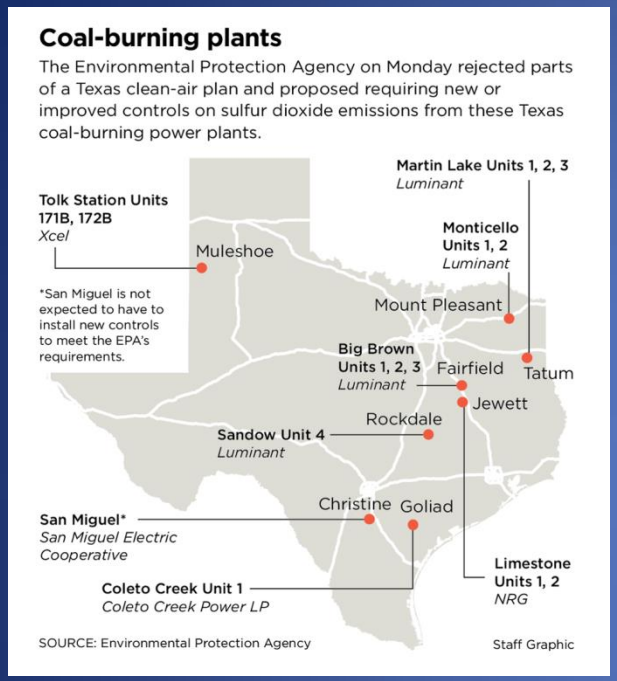


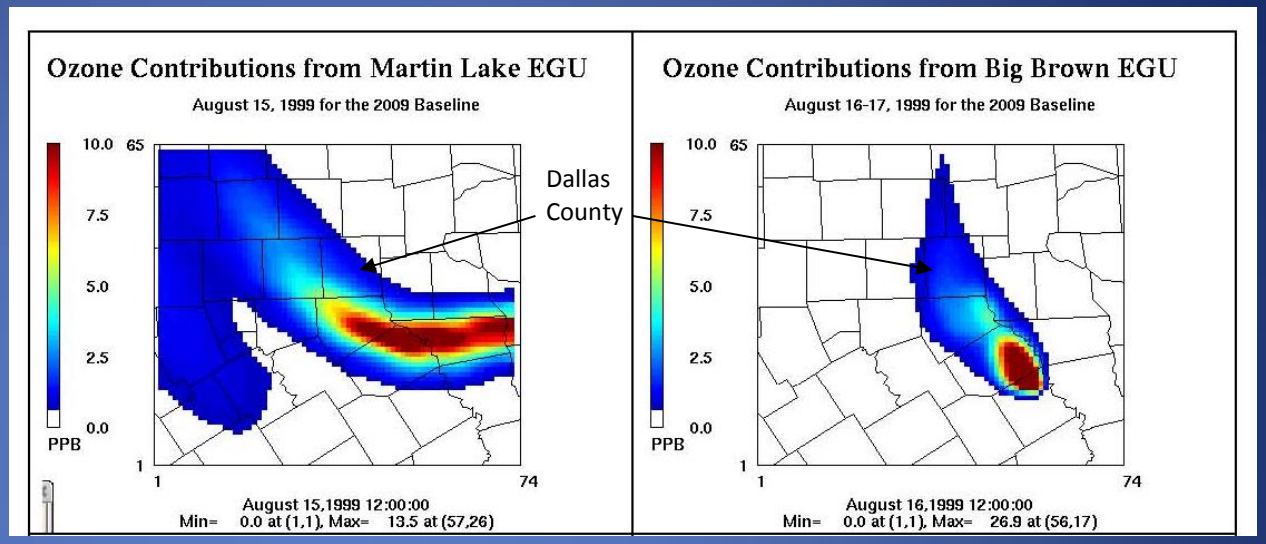




*"Design value" is the 3-year running average of the annual 4th highest ozone value.

5 Legacy Coal-Fired Power Plants Upwind from DFW Contribute NOx to DFW Air





DCMS Efforts to Reduce Coal Plant Emissions

- 2003 – Began studying the problem and introducing policy through TMA House of Delegates
- 2007 – Commissioned Rice technical report on the problem and options to correct the problem without endangering energy generation
- 2013 – Commissioned update of the Rice report.
- 2013 – Submitted petition for rule change to TCEQ to require all coal plants to meet current EPA emission standards. TCEQ rejected petition and pledged to address it in 2015 SIP.
- 2015 – TCEQ plan submitted for the SIP ignored the problem and model projected compliance by 2018 without action
- 2015 – Energy Future Holdings declares bankruptcy. Court will determine fate of the Luminant assets including coal plants.

Independent Mathematical Modeling to Estimate the Contribution of the Coal Plants for DFW-area Ozone Levels

- Dr. Kuruvilla John, University of North Texas
  - Expert air quality scientist
  - Developing model to estimate contributions of all area emission sources.
  - Found that the 5 East Texas coal plants contribute an average of 5 ppb to DFW-area ozone. (Remember that the EPA standard is 75 ppb, and DFW stands at 83 ppb.)

- Drs. Robert Haley and Martha Carvour at UTSW
  - Epidemiologists
  - Developing model of the reduction in health effects from a drop of 5 ppb from retrofitting or closing the 5 coal plants.

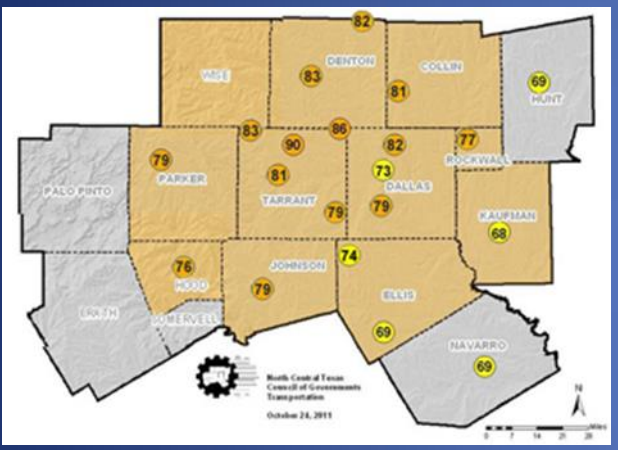
BenMAP-CE Software

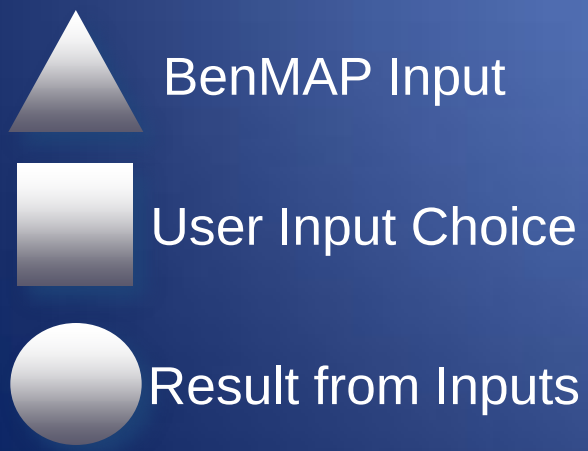
Benefits Mapping, Community Edition (V 1.1)

- Air quality modeling software package developed by EPA and RTI International
- From daily ozone levels measured by EPA monitors, population numbers, baseline disease rates, and concentration-response functions, one can estimate the reductions in adverse health effects from a given drop in ozone levels:
  - Asthma attacks, COPD exacerbations, MIs, deaths, lost school days, lost work days, minor restricted activity days, etc.
  - Economic value of these reductions.
- We studied the benefits of a 5 ppb reduction in ozone levels that Dr. John's model estimated from curtailing emissions from the 5 East Texas coal-fired power plants.

The Data BenMAP Uses to Perform a Benefits Analysis

Locations of EPA air monitors in the 10-county non-attainment region that provide daily air quality monitoring data for BenMAP





Source of the Concentration-Response Function for Ozone Effect on Mortality

- From 71 time-series studies relating ozone to all-cause mortality, the authors selected 48 functions from 28 studies.
- Metaregression controlling for effects of other pollutants, etc.
- Estimated the grand mean among all the studies of a 0.41% increase in mortality per 10 ppb increase in ozone concentration.
- Prevalence of air-conditioning and lag time were strongest predictors of between-study variance.

Ozone Exposure and Mortality

An Empiric Bayes Metaregression Analysis

Jonathan I. Levy, Susan M. Chemerynski, and Jeremy A. Sarnat

Background: Results from time-series epidemiologic studies evaluating the relationship between ambient ozone concentrations and premature mortality vary in their conclusions about the magnitude of this relationship, if any, making it difficult to estimate public health benefits of air pollution control measures. We conducted an empiric Bayes metaregression to estimate the ozone effect on mortality, and to assess whether this effect varies as a function of hypothesized confounders or effect modifiers.

Methods: We gathered 71 time-series studies relating ozone to all-cause mortality, and we selected 48 estimates from 28 studies for the metaregression. Metaregression covariates included the relationship between ozone concentrations and concentrations of other air pollutants, proxies for personal exposure–ambient concentration relationships, and the statistical methods used in the studies. For our metaregression, we applied a hierarchical linear model with known level-1 variances.

Results: We estimated a grand mean of a 0.21% increase (95% confidence interval = 0.16–0.26%) in mortality per 10-μg/m^3 increase of 1-hour maximum ozone (0.41% increase per 10 ppb) without controlling for other air pollutants. In the metaregression, air-conditioning prevalence and lag time were the strongest predictors of between-study variability. Air pollution covariates yielded inconsistent findings in regression models, although correlation analyses indicated a potential influence of summertime $PM_{2.5}$.

Conclusions: These findings, coupled with a greater relative risk of ozone in the summer versus the winter, demonstrate that geographic and seasonal heterogeneity in ozone relative risk should be anticipated, but that the observed relationship between ozone and mortality should be considered for future regulatory impact analyses.

(*Epidemiology* 2005;16: 458–468)

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Although ozone exposure has well-documented influences on respiratory health, including increased airway resistance and lung function decrements,[1,2] determining and quantifying its causal effect on premature mortality remains a challenge. In recent regulatory impact analyses of air pollution control measures,[3–5] the U.S. Environmental Protection Agency (EPA) excluded the ozone–mortality relationship from primary benefits estimates, stating that the epidemiologic literature was too uncertain to infer causality and provide reasonable quantitative estimates.

For ozone–mortality time-series studies, there are a few primary concerns. First, ozone concentrations are frequently correlated with concentrations of other air pollutants, which themselves have been causally linked with mortality. Because of the strong and consistent epidemiologic literature linking particulate matter (PM) and mortality,[6–9] any observed relationship between ozone and mortality could simply reflect PM effects that were not adequately captured in the analysis. Other air pollutants such as carbon monoxide (CO), sulfur dioxide (SO_2), or nitrogen dioxide (NO_2) may be influential as well. Second, because ozone formation is greatest on hot and humid days, which are independently associated with increased mortality,[10,11] proper statistical controls for weather in the analysis are crucial (and often difficult to model).

In addition, because ozone is highly reactive in indoor environments (where people spend most of their time), ambient ozone concentrations tend to be higher than personal ozone exposures.[12,13] This makes epidemiologic findings based on central site monitors difficult to interpret. Air conditioning further reduces indoor ozone concentrations, especially on the hot and humid days when ozone concentrations are generally highest.[12–14] Finally, annually averaged ozone–mortality risks are hard to interpret due to seasonal differences in ozone levels, an inadequate dynamic range during the winter, and differences among personal exposure–

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Source of the Concentration-Response Function for Ozone Effect on Hospital Admissions

- From 96 time-series studies relating ozone levels to hospital admissions, selected 136 estimates to analyze.
- Emergency hospital admissions increased 4.47% per 10 ppb increase in ozone concentration.
- Controlling for publication bias adjusted the increase to 2.97% per 10 ppb increase.

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Meta-analysis of the association between short-term exposure to ambient ozone and respiratory hospital admissions

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Abstract
Ozone is associated with health impacts including respiratory outcomes; however, results differ across studies. Meta-analysis is an increasingly important approach to synthesizing evidence across studies. We conducted meta-analysis of short-term ozone exposure and respiratory hospitalizations to evaluate variation across studies and explore some of the challenges in meta-analysis. We identified 136 estimates from 96 studies and investigated how estimates differed by age, ozone metric, season, lag, region, disease category, and hospitalization type. Overall results indicate associations between ozone and various kinds of respiratory hospitalizations; however, study characteristics affected risk estimates. Estimates were similar, but higher, for the elderly compared to all ages and for previous day exposure compared to same day exposure. Comparison across studies was hindered by variation in definitions of disease categories, as some (e.g., asthma) were identified through ⩾3 different sets of ICD codes. Although not all analyses exhibited evidence of publication bias, adjustment for publication bias generally lowered overall estimates. Emergency hospitalizations for total respiratory disease increased by 4.47% (95% interval: 2.48, 6.50%) per 10 ppb 24 h ozone among the elderly without adjustment for publication bias and 2.97% (1.05, 4.94%) with adjustment. Comparison of multi-city study results and meta-analysis based on single-city studies further suggested publication bias.

Keywords: ozone, hospital admissions, human health, air pollution, meta-analysis
S Online supplementary data available from stacks.iop.org/ERL/6/024006/mmedia

1. Introduction

Ozone is a highly reactive air pollutant that can irritate airways and interfere with host defense mechanisms [1] and is associated with the risk of respiratory symptoms (e.g., coughing, wheezing), mortality, and hospital admissions [2, 3]. Time-series and case-crossover studies have examined the risk of respiratory hospitalizations or emergency room/department visits (emergency visits) as a function of short-term exposure to ambient ozone.

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Many single-city studies observed associations between ozone and hospital admission for respiratory diseases [4–7], including total respiratory diseases or general respiratory illness [8–23] and cause-specific respiratory diseases such as pneumonia [10, 24–26], chronic obstructive pulmonary disease (COPD) [10–25, 27–32], and asthma [31, 33–50]. Other studies reported no association or inconsistent results for total or general respiratory illnesses [51–59] or specific respiratory diseases [58, 60–70]. Some studies found mixed results for different age groups or seasons [71–73]. Other potential confounders include co-pollutants, such as particulate matter (PM), with results differing by study [30, 32, 37, 75, 77].

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Results of BenMAP-CE Modeling

Adverse Events Avoided by a 5 ppb Reduction in Ozone Level

Annual incidence

County	Admissions for respiratory, ages 0-99, ± 50% (Ji et al.)	ER visits for respiratory, ages 0-99, ± 38% (Ji et al.)	Minor restricted activity days, ages 18-64, ± 29% (Ostro et al.)	Lost school days, ages 5-17, ± 54% (Gilliland et al.)	All cause mortality, ages 0-99, ± 16% (Levy et al.)
Dallas	53.5	116.3	49,552	40,548	26.3
Tarrant	43.7	96.2	40,944	33,542	22.4
Collin	20.8	51.9	23,077	18,185	9.6
Denton	20.5	42.5	19,259	14,655	7.2
Johnson	7.3	8.9	3,685	3,112	2.6
Ellis	4.4	8.0	3,322	2,811	2.1
Parker	4.9	7.4	3,198	2,419	2.4
Kaufman	4.7	6.3	2,625	2,220	1.9
Rockwall	2.2	5.3	2,241	1,889	1.3
Wise	1.8	3.1	1,346	1,033	0.9
All 10	163.8	345.9	149,249	120,415	76.8
34 counties	204.0	399.4	170,940	137,348	97.2

Results of BenMAP-CE Modeling

Adverse Events Avoided by a 5 ppb Reduction in Ozone Level

Annual economic costs

County	Admissions for respiratory, 0-99, ± 50% (Ji et al.)	ER visits for respiratory, 0-99, ± 38% (Ji et al.)	Minor restricted activity days, 18-64, ± 30% (Ostro et al.)	Lost school days, 5-17, ± 54% (Gilliland et al.)	All cause mortality, 0-99, ± 69% (Levy et al.)	Total annual economic costs
Dallas	$1,048,273	$36,245	$4,844,848	$3,041,091	$166,618,096	$175,588,553
Tarrant	858,559	29,975	4,003,245	2,515,671	141,572,560	$148,980,010
Collin	413,641	16,168	2,256,318	1,363,866	60,452,092	$64,502,085
Denton	404,938	13,242	1,883,016	1,099,139	45,659,292	$49,059,627
Johnson	144,138	2,775	360,278	233,423	16,580,243	$17,320,857
Ellis	86,751	2,478	324,810	210,808	13,312,823	$13,937,670
Parker	96,114	2,299	312,718	181,435	15,211,458	$15,804,024
Kaufman	91,816	1,955	256,630	166,514	12,138,001	$12,654,916
Rockwall	43,708	1,651	219,108	141,690	8,040,784	$8,446,941
Wise	36,379	971	131,560	77,506	6,004,427	$6,250,843
All 10	$3,224,315	$107,760	$14,592,530	$9,031,142	$485,589,775	$512,545,522
34 counties	$4,011,313	$124,427	$16,713,294	$10,301,110	$614,400,072	$645,550,216

Authorship of the health and economic impact functions are given in parentheses.

Standard deviations of the estimates are uniform down a column and are given by ± a percentage of the estimates.

Estimated Health Benefits from 3 Levels of Ozone Reduction to Reach EPA New Standard of 70 ppb

5 ppb drop in ozone levels (design value 83 to 78)						
County	Admissions for respiratory, ages 0-99, ± 50% (Ji et al.)	ER visits for respiratory, ages 0-99, ± 38% (Ji et al.)	Minor restricted activity days, ages 18-64, ± 29% (Ostro)	Lost school days, ages 5-17, ± 54% (Gilliland)	All cause mortality, ages 0-99, ± 16% (Levy)	Total annual economic costs
Annual Incidence						
Dallas Co.	53.5	116.3	49,552	40,548	26.3	
All 10	163.8	345.9	149,249	120,415	76.8	
34 counties	204.0	399.4	170,940	137,348	97.2	
Annual Economic Costs						
Dallas Co.	$1,048,273	$36,245	$4,844,848	$3,041,091	$166,618,096	$175,588,553
All 10 Co.'s	$3,224,315	$107,760	$14,592,530	$9,031,142	$485,589,775	$512,545,522
34 counties	$4,011,313	$124,427	$16,713,294	$10,301,110	$614,400,072	$645,550,216

Estimated Health Benefits from 3 Levels of Ozone Reduction to Reach EPA New Standard of 70 ppb

10 ppb drop in ozone levels (design value 83 to 73)						
County	Admissions for respiratory, ages 0-99, ± 50% (Ji et al.)	ER visits for respiratory, ages 0-99, ± 38% (Ji et al.)	Minor restricted activity days, ages 18-64, ± 29% (Ostro)	Lost school days, ages 5-17, ± 54% (Gilliland)	All cause mortality, ages 0-99, ± 16% (Levy)	Total annual economic costs
Annual Incidence						
Dallas Co.	107.0	232.6	99,104.0	81,096.0	52.6	
All 10	327.6	691.8	298,498.0	240,830.0	153.6	
34 counties	408.0	798.8	341,880.0	274,696.0	194.4	
Annual Economic Costs						
Dallas Co.	$2,096,546	$72,490	$9,689,696	$6,082,182	$333,236,192	$351,177,106
All 10 Co.'s	$6,448,630	$215,520	$29,185,060	$18,062,284	$971,179,550	$1,025,091,044
34 counties	$8,022,626	$248,854	$33,426,588	$20,602,220	$1,228,800,144	$1,291,100,432

15 ppb drop in ozone levels (design value 83 to 68)						
County	Admissions for respiratory, ages 0-99, ± 50% (Ji et al.)	ER visits for respiratory, ages 0-99, ± 38% (Ji et al.)	Minor restricted activity days, ages 18-64, ± 29% (Ostro)	Lost school days, ages 5-17, ± 54% (Gilliland)	All cause mortality, ages 0-99, ± 16% (Levy)	Total annual economic costs
Annual Incidence						
Dallas Co.	160.5	348.9	148,656.0	121,644.0	78.9	
All 10	491.4	1,037.7	447,747.0	361,245.0	230.4	
34 counties	612.0	1,198.2	512,820.0	412,044.0	291.6	
Annual Economic Costs						
Dallas Co.	$3,144,819	$108,735	$14,534,544	$9,123,273	$499,854,288	$526,765,659
All 10 Co.'s	$9,672,945	$323,280	$43,777,590	$27,093,426	$1,456,769,325	$1,537,636,566
34 counties	$12,033,939	$373,281	$50,139,882	$30,903,330	$1,843,200,216	$1,936,650,648

Authorship of the health and economic impact functions are given in parentheses.

Standard deviations of the estimates are uniform down a column and are given by ± a percentage of the estimates.

Sierra Club Ex. 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

FEB 11 2015

Ms. Kathy Singleton
MC 206, State Implementation Plan Team
Air Quality Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Re: Dallas-Fort Worth Attainment Demonstration for the 2008 Eight-Hour Ozone Nonattainment Area, Project Number 2013-015-SIP-NR; Dallas-Fort Worth Reasonable Further Progress State Implementation Plan Revision for the 2008 Eight-Hour Ozone Standard, Project Number 2013-014-SIP-NR;Revisions to Chapter 115, Project Number 2013-048-115-AI; and Revisions to Chapter 117, Project Number 2013-049-117-AI

Dear Ms. Singleton:

Thank you for the opportunity to review the four proposed revisions that address the Dallas/Fort Worth (DFW) nonattainment area under the 2008 ozone standard. We have enclosed comments on the proposed attainment demonstration and RFP SIPs, and on the proposed revisions to Chapters 115 and 117. We appreciate the work by the TCEQ in developing these documents. Nonetheless, additional ozone reductions will be necessary to demonstrate attainment.

The proposed attainment demonstration (Project Number 2013-015-SIP-NR) is based on an attainment date of December 31, 2018. On December 23, 2014, the U.S. Court of Appeals for the D.C. Circuit held that the end of year attainment dates were not consistent with Congressional intent. *NRDC v. EPA*, 2014 U.S. App. LEXIS 24253 (D.C. Cir. 2014). Therefore, the EPA intends to promulgate a rulemaking to revise the attainment dates to a timeframe consistent with the court's decision. As a result, we anticipate that the attainment date will be earlier than the end of the 2018 ozone season, which means that the attainment year ozone season for the DFW nonattainment area will likely be 2017 rather than 2018.

We understand the loss of a year to demonstrate attainment presents challenges for the State. For example, the State will lose a year of expected ozone reductions from fleet turnover. These potential reductions will need to be "found" in other means to show attainment by the 2017 ozone season. While this will take further analysis and consideration by Texas, we are committed to working with you to identify solutions.

We look forward to discussing the enclosed comments with you. Please feel free to contact me or Ms. Carrie Paige of my staff at 214-665-6521, if you have questions.

Sincerely yours,

Guy Donaldson, Chief
Air Planning Section

Enclosure

Project Number 2013-015-SIP-NR

Comments addressing the Dallas-Fort Worth Attainment Demonstration (AD)

The attainment year ozone season is the ozone season immediately preceding a nonattainment area's attainment date. In light of the recent decision made by the U.S. Court of Appeals for the D.C. Circuit,[1] we anticipate that the attainment date for the DFW area will be earlier than the end of the 2018 ozone season and thus, the attainment year ozone season for the DFW area will likely be 2017. Please revise the applicable elements of the attainment demonstration submittal to reflect the earlier attainment date. We expect the SIP requirements rule will be finalized soon addressing the Court's decision regarding the attainment date.

The attainment demonstration Motor Vehicle Emissions Budget (MVEB) will need to be revised to reflect the earlier attainment date.

The contingency plan is based on emission reductions from fleet turnover in 2019. The contingency plan will need to be revised to reflect the earlier attainment date. In addition, in the June 6, 2013 proposal for the ozone implementation rule, we proposed establishment of MVEBs consistent with the use of on-road fleet turnover as a contingency measure (see 78 FR 34178, 34199). Having such budgets would help to ensure that reductions from a fleet turnover contingency measure would be surplus and available for the SIP in the event that the contingency measures are triggered. TCEQ should include a MVEB for the fleet turnover contingency measure.

TCEQ has worked to refine its modeling platform using 2006 base case periods and evaluation of 2018 future year ozone levels. In accomplishing this work, TCEQ has performed a number of analyses to evaluate the model performance of the 2006 base case periods following EPA's modeling guidance. We appreciate TCEQ providing the supplemental modeling with updated emission inventory and model projections based on both EPA's existing 2007 modeling guidance and the new DRAFT modeling guidance methods that are currently out for public review and comment until March 13, 2015. We note using the new DRAFT modeling guidance methods, TCEQ projects all but one monitor to be in attainment (below 76 ppb) in 2018, and the Denton Airport South monitor is projected to be 76.13 ppb (design value or DV of 76). Using EPA's 2007 modeling guidance methods the values were projected to be slightly higher in 2018 with Denton at 77 ppb and Eagle Mtn. Lake and Grapevine monitors projected to be 76 ppb.

As part of the model platform evaluation and weight of evidence (WOE) TCEQ has done a number of modeling analyses and also evaluated emissions and monitoring trends. Overall we think the modeling is performing reasonably well, but there are some concerns with model performance of transported ozone and ozone precursors as discussed below and by TCEQ in Appendix C of the proposal. Overall the WOE components raise some concern about whether the DFW area will be able to obtain the 2008 8-hour ozone standard of 75 ppb in 2018. The recent court decision that indicates the attainment year will likely be 2017 for moderate classification areas such as DFW, makes it less clear that the area will attain the standard by 2017 without additional reductions. See below for more detailed comments on the modeling and WOE.

[1] *NRDC v. EPA*, 2014 U.S. App. LEXIS 24253 (D.C. Cir. Dec. 23, 2014).

Comments addressing the RACM analysis

Please provide the estimated amount of NOx emission reductions (in tpd) that would reduce ozone values at the monitors by 1 ppb. In the Tables in Appendix D, please include the estimated emissions reductions associated with each of the measures. This additional information will help determine which measures, separately or in combination, would assist in advancing the attainment date for measures that can be implemented prior to the beginning of the attainment year ozone season.

Within the RACM analysis, the TCEQ estimates that reducing the source cap for the kilns in Ellis County would not provide significant NOx emission reductions for the DFW area. However, a reduction in the source cap of 4.6 tpd, as estimated by the TCEQ, does appear significant, compared with the emissions reductions estimated for other sources of NOx in the DFW area. What modeling or other analyses were performed that support the TCEQ's conclusion regarding the source cap?

The TCEQ provided an evaluation of emissions from all of the utility electric generators in east and central Texas. However, the discussion in Appendix D on the formation, background levels, and transport of ozone strongly supports the implementation of controls on NOx sources located to the east and southeast of the DFW nonattainment area. How would a reduction in NOx emissions from utility electric generators in just the counties closest to the eastern and southern boundaries of the DFW area impact the DFW area?

Comments addressing the proposed VOC RACT analysis

EPA supports the inclusion of major sources of VOC located in Wise County to become subject to the requirements of 30 TAC Chapter 115.

EPA appreciates the VOC RACT analysis provided by TCEQ.

Comments addressing the proposed NOx RACT analysis

There has been a significant drop in the ambient NOx concentration for Ellis County in part due to past NOx control measures concerning cement kilns operating in the DFW nonattainment area and we applaud TCEQ for these efforts. Because of significant changes in the type and number of cement kilns in Ellis County, however, TCEQ's rules need to be reevaluated to insure these reductions are maintained, and the emission limits reflect a RACT level of control as required by the Clean Air Act.

In particular, the retirement of the higher emitting wet kilns and operation of more energy efficient and lower emitting dry kilns in Ellis County makes it necessary for the TCEQ to revisit its NOx cap limit, set forth in 2007 at 17.4 tons per day (tpd). This limit was set, in part, based on higher emission rates for wet kilns. Therefore, with fewer sources contributing to the cap, the dry kilns essentially have a less stringent emission rate requirement. We can no longer conclude the emission limit that is in place reflects a RACT level of control. An evaluation of the RACT for cement kilns in Ellis County is needed that reflects the level of control that can reasonably be achieved and new limits to reflect the reasonable level of control. TCEQ can either establish appropriate rate based limits (lbs/ton of clinker) for each unit or it can establish a cap based on appropriate rate based emission rates. It is important to recognize that the SIP emission limit needs to reflect RACT. We believe that a rate base limit will preserve any necessary operational flexibility as it sets no limit on production rates. Failure to conduct a thorough RACT analysis for cement kilns which would include appropriate emission limits would prevent us from approving the RACT portion of the attainment plan submittal.

Comments addressing the proposed AD SIP, Appendix H: Local Initiatives Submitted by the North Central Texas Council of Governments

We appreciate the work done by the North Central Texas Council of Governments (NCTCOG) in developing the list of local initiatives. The submittal letter from the NCTCOG indicates that the initiatives are "expected to be implemented by 2018." In light of the recent Court decision[2] and consequential need for EPA to establish an earlier attainment date, please list the local initiatives that will be completed by March 1, 2017.

DFW AD/WOE Detailed comments

As discussed above, EPA provided new DRAFT modeling guidance (Dec. 2014) that is currently out for review and stakeholder comments until March 13, 2015. EPA's current plan is to review comments and finalize the revised modeling guidance by the end of the year (2015). The guidance may change further based on comments. In this transitional period, we recommend that TCEQ continue to provide the attainment test analysis using both the existing 2007 modeling guidance approach and the new approach recommended in the December 2014 DRAFT modeling guidance.

The updated modeling results provided in early January by TCEQ indicate one monitor at 76 ppb in 2018 using the new DRAFT guidance and existing guidance methods indicate 77 ppb at Denton and 76 ppb at Eagle Mtn. Lake and Grapevine. We note that these numbers will most likely go up some with an attainment demonstration based on 2017. We request that TCEQ supplement their analysis as needed to show that the area will attain by 2017.

There should be further analysis and documentation evaluating the days being used in the attainment test. The days that are being used at each monitor should be identified. In limiting the days to 10 days, an evaluation of the performance on each day and the type of meteorology/transport phenomena of each day should be provided. The main principal of the attainment test is to limit the days to the higher days at the monitor, but there needs to be an evaluation of the days used to make sure that the set of days used represents the conceptual model for the area and is representative of all the days that yield ozone exceedances. In doing this evaluation it may be that more than 10 days are necessary for some monitors. For example: the later summer episode is important to the conceptual model and some of these days may not be included based on the 10 days threshold.

Overall, the WOE analysis is not overly supportive that the modeling is conservative. TCEQ has provided information on recent ozone trends to support its conclusion the area will attain by 2018. Most of the recent years, however, have been average or below normal in overall conduciveness for ozone formation. Temperature has been high for some of these years which does lead to higher ozone, but wind speeds have also been higher than normal which leads to lower ozone concentration with more dispersion. 2011 was one of these type of years. 2014 had very favorable meteorology and was one of the lowest ozone monitoring years in the Eastern half of the US with a 2014 DFW area DV of 81 ppb. It was abnormal, due to its lower than average temperature and frequency of frontal passages that led to reduced background build up, and not likely to be repeated.

The 2013 DV data for the DFW area was 87 ppb, indicating an 11 ppb drop would have to occur within four to five years to reach attainment in 2017 or 2018. Even considering the anomalous 2014, the area has to drop another 6 ppb.

[2] *NRDC v. EPA*, 2014 U.S. App. LEXIS 24253 (D.C. Cir. Dec. 23, 2014).

We note that normal on-road/non-road fleet turnover within areas of DFW and Texas will help lower ozone levels in the DFW area. In TCEQ's SIP proposal, TCEQ provides a long term trends analysis that also included a linear relationship to estimate the long term ozone level change. This equation indicates the 8-hour values have dropped at a rate of 1.1 ppb per year. We modified the table to extrapolate the DFW 8-hour ozone DVs in 2017 and 2018, which were still 80-82 ppb for these future years based on this rate of reduction. See Figure 1 on page 7. Since the overwhelming majority of reductions of NOx in the plan are the federal measures for on road and off road sources, it seems unreasonable to expect this rate of reduction to accelerate. Based on the monitoring data and lack of additional large reductions in NOx within areas of Texas that impact DFW, it is difficult to see how the area would reach attainment in 2018 based solely on federal measures reductions from mobile and non-road. The fact that the attainment year will likely be 2017 makes the chance of attainment smaller.

Evaluation of the model performance data and source apportionment indicates that the model may be oversensitive to low-level NOx reductions and has some issues with NOx level predictions in the DFW area. We note that the kv patch (vertical diffusivity patch) to induce more vertical mixing may be resulting in better ozone performance in the base case, but the atmosphere may not be mixing as rapidly as the patch is indicating. This would result in the model being overly sensitive to low-level NOx reductions. This may compensate for emission projection errors in the base case, thus resulting in better model performance. We suspect the model may be providing more mixing than really occurs based on NO2 monitoring throughout the domain compared to modeled values. In particular, it tends to under-predict NOx concentrations in the western half of the domain and over-predict NOx concentrations in the upwind region. These issues with the NOx modeled levels could result in inaccurate ozone predictions and raise uncertainty in the attainment demonstration.

While the State has provided a large chapter on Weight of Evidence, the principal evidence is the recent monitor data. The monitor data does not show the large drops in local ozone levels and therefore raises a fundamental question whether the photochemical modeling is working as an accurate tool for assessing attainment in 2018 for DFW.

We also note that the modeling seems to project significant reductions due to out-of-state emission reductions, which reflects some of the expected trends in declining regional ozone levels.

Episode Analysis

Overall the June 2006 episode is a good episode and representative of the type of days from the conceptual model that drive the early summer exceedances in the DFW area. The inclusion of Aug-Sep 2006 is an improvement and attempts to include days that make up the latter summer period in DFW that are historically the worst days overall and usually drive the DV for the area. Latter summer 2006 was not typical and was actually light on ozone exceedances compared to the conceptual model, but was a step in the right direction. Because this period was below average it still hinders the analysis of later summer ozone events. Given the bimodal (peaks in June and higher peaks in Aug/Sep) we still have concern that the days that drive the overall DV and attainment of the area are underrepresented in the analysis.

Model Performance Analysis

We appreciate TCEQ's efforts to analyze the Model Performance of the base case modeling. In Appendix C, we note that for the August/September episode, the average over-prediction of observed Maximum Daily Average 8-hour Ozone (MDA8) ozone values is over 10 ppb (Figure 4-4 of the proposal,

first set of bars), which is sufficient to cause concern. The TCEQ is investigating the causes of this bias and will take appropriate steps to ameliorate it, if possible, in the near future.

Strong underestimation of NOx at Kaufman area high monitored values could be affecting daytime scavenging. Hinton peak NOx may seem to be slightly overestimated, but given the close proximity to the I-35 corridor which is a large NO/NO2 source, modeled values would likely be higher for both the bilinear interpolation values and the 3x3 array values. Looking at the Ft. Worth NW monitor, it appears ozone on some high ozone days is being overestimated with a spread in the 75-90 ppb range, but the NOx seems underestimated on some of the higher ozone days/higher NOx monitored days. The underestimation bias on the highest NOx monitored days may be part of the reason for ozone overestimation especially in the latter summer episode. The overestimation of isoprene may also be playing into what is perceived as an ozone overestimation bias on the highest values.

The model performance time series analysis in Appendix C had modeled concentrations of HRVOC species much higher than observed at Hinton Street C401 and at Fort Worth Northwest C13 monitors.

Modeling on a number of days seems to be overestimating the MDA8 and overall ozone levels at the upwind monitors in the DFW area and this overestimation of background may be part of the reason for overestimation at downwind monitors. On some of these days this may indicate the local production is actually biased low on days that appear to have good downwind model performance. Looking at the analysis at the other upwind regional monitors (Italy, San Augustine, Clarksville, and Palestine) all appear to have an overestimation of regional levels and are especially off in the nighttime values. Modeled nighttime values range from 20-60 ppb higher, compared to monitor values. This is probably leading to the DFW upwind monitor performance issues especially on the morning hours and even on the MDA8 for many days. This issue may lead to the model being more responsive to regional background level changes than local changes.

We recommend identifying the 10 days used for each monitor on the daily ozone MDA8 plots in Figure 4 of the proposal. This could potentially be accomplished by adding the specific monitors on each day that was the day was used for the RRF analysis. As discussed above please document and show how the days (10 or more) fit with the overall conceptual model for the DFW area.

We appreciate the Source apportionment modeling that was included and find it informative. We note that it seems to indicate lower contributions from outside of Texas, than the upwind monitor analysis that Texas included. This is not surprising as the upwind monitor analysis approach can overestimate the amount of background ozone that is contributing to the exceedance since the monitor is not always completely upwind and does not necessarily pair in time with the contribution further downwind. On some of the highest transport days that also saw local exceedances predicted in DFW, the non-Texas component was usually less than 50 ppb and often 45-40 ppb or less. The source apportionment analysis comports with previous source apportionment analyses indicating that on many high ozone days in the DFW area, Texas sources contribute approximately half of the ozone.

WOE/Corroborative Analysis

Recent NOx trends (Figure 5-10 in TCEQ's Proposal) indicate a fairly flat NOx trend for several NO monitors in the western area of the DFW area (Eagle Mtn. Lake, Denton, and Parker County monitors). These monitors are in areas more impacted by the growth in NOx sources for Oil and Gas Development that seem to be countering the normal reduction in NOx levels seen at other monitors due to fleet turnover reductions (on-road and Nonroad). These higher NOx levels in the modeling domain that seem

to be fairly flat with no change since 2009 raise concern that the area is not seeing the NOx reductions needed to bring the ozone levels down at these monitors.

We note that the attainment demonstration modeling includes reductions in NOx and VOC in Wise County from controls proposed for RACT in Wise County. These emission reductions were discussed/quantified in Appendix B of the proposal. Any SIP revisions based on removing Wise County would have to have the modeling adjusted so that it does not take credit for unenforceable reductions. Please confirm the estimate NOx emission reductions in Wise County match with the adopted regulations for NOx control in Wise County.

Previous control requirements put in place on natural gas fired compressor engines in the DFW 9-county area and in many upwind counties relied on NSCR catalytic convertors that typically require periodic changing of catalysts to maintain estimated control levels. Has Texas done any follow-up to confirm that proper maintenance is occurring to ensure the controls are still meeting the requirements?

The modeling includes emissions from Natural Gas production in the Barnett Shale area and projects NOx emissions to directly correlate with a decline in production levels. We have some concern that as well pressure diminishes that natural gas fired engines driving natural gas compressors may be utilized more than the current usage per production amount. This may result in the projected NOx emissions not dropping as much as projected. The same volume of gas being produced with less well head pressure flow could need more overall actual compression to get to market. This situation could result in more NOx emissions than estimated based on the current emissions/production level relationship. We recommend that TCEQ perform a study to confirm that the emissions trends projected in the modeling have occurred.

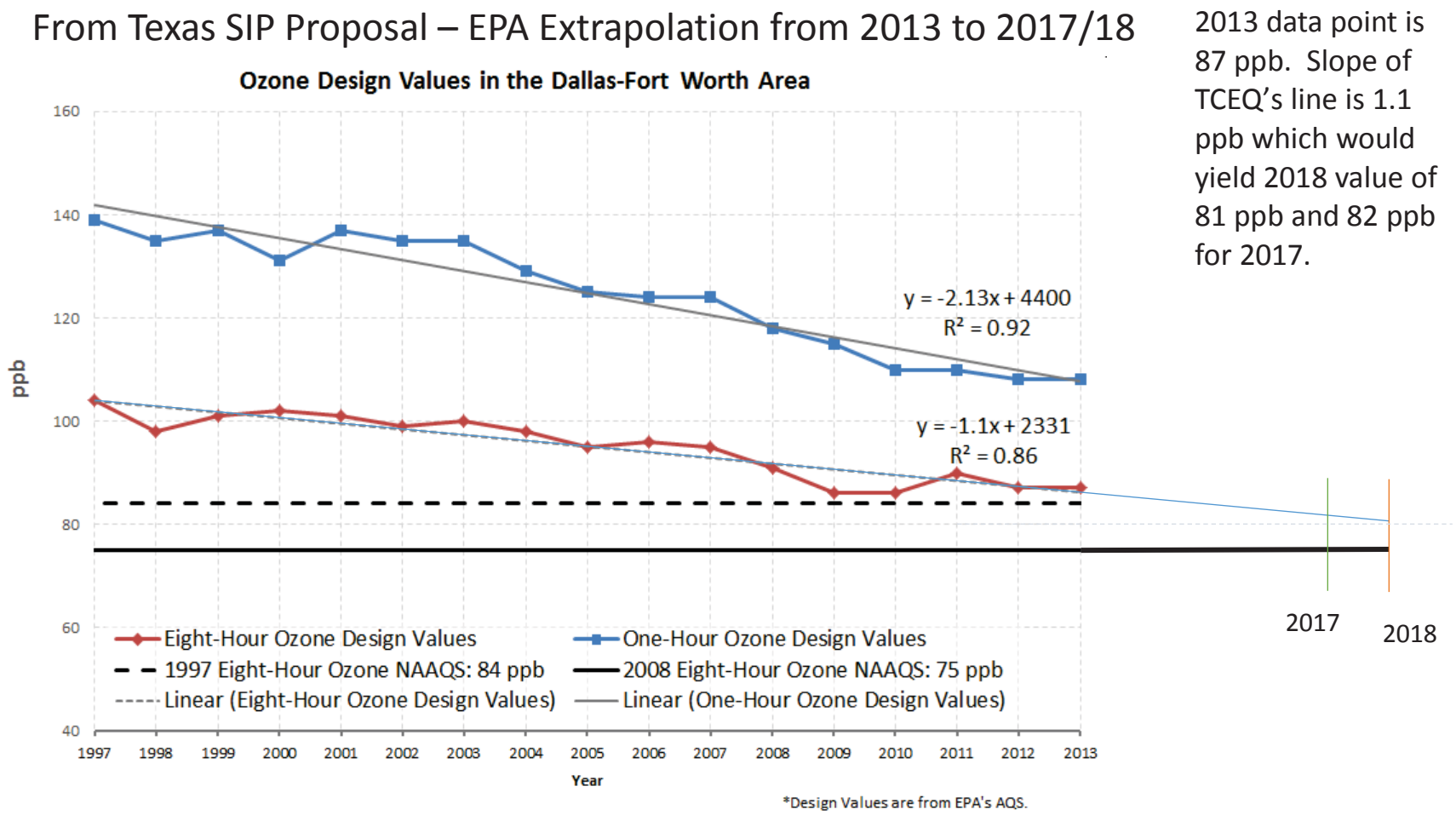
We note that there is some discussion of ERCs and DERCs in Appendix B of the proposal. That discussion indicates that there are 363 tpy of NOx ERCs and over 6000 tons of DERCs. Please clarify the calculation that resulted in 17 tpd of NOx being included in the model. Please explain and document how the NOx and VOC ERCs/DERCs were allocated in the modeling, including spatial allocation (daily DERC emissions plots). Also, please clarify if the attainment demonstration takes into account any emergency use of DERCs beyond the flow control limit (e.g., emergency use declared by ERCOT). It might be helpful to look at any past emergency usage of DERCs and generate a memo documenting past usage rates and whether or not the DFW area had any exceedances monitored on those days and provide that in the documentation.

Summary of Analysis of the Attainment Demonstration and WOE/Corroborative Analysis

We appreciate TCEQ's efforts to provide comprehensive modeling using an episode that includes additional days in attempt to provide representative modeling. As noted above, despite TCEQ efforts, there are concerns with model performance. There are also concerns that even with the additional episode days, the episode overall is not fully representative of the most difficult ozone scenarios. In addition, while current ozone trends and the model predictions support that ozone levels will continue to improve, it is not clear to EPA that these trends are sufficient for the area to attain by 2018.

Unfortunately, as discussed above, we anticipate that the attainment year ozone season for the DFW area will likely be 2017 rather than 2018. The attainment demonstration will need to be reworked to provide for attainment by 2017. EPA stands ready to work with TCEQ to develop streamlined modeling approaches and weight of evidence approaches for 2017. We note, however, that we believe it is likely that additional reductions will need to be included to demonstrate attainment.

Figure 1: Long term DFW 8-hour monitoring trends



2013 data point is 87 ppb. Slope of TCEQ's line is 1.1 ppb which would yield 2018 value of 81 ppb and 82 ppb for 2017.

Rule Project Number 2013-048-115-AI

Comments addressing Chapter 115 revisions to implement Reasonably Available Control Technology (RACT) for all emissions sources addressed in a control techniques guidelines (CTG) and all non-CTG major sources of VOCs in the DFW 2008 eight-hour ozone moderate nonattainment area (serious -- Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant, and moderate -- Wise).

1. Support for Revisions

   In general, we are supportive of this rule project to implement RACT for emissions sources of VOCs in the DFW ten county area.

2. Compliance Schedules for Wise County

   At the time of this review, Wise County is currently designated as nonattainment for the 2008 eight hour standard. Subchapter A Definitions, Section 115.119 (h), Compliance Schedules states: "Upon the date the commission publishes notice in the *Texas Register* that Wise County is no longer designated nonattainment for the 2008 Eight-Hour Ozone National Ambient Air Quality Standard, the owner or operator of each storage tank is not required to comply with any of the requirements in this division."

   This provision is not approvable as proposed because it does not contain a replicable procedure to change the applicability of a SIP requirement. EPA's designation of Wise County is currently under review in the D.C. Circuit Court of Appeals (*Mississippi Commission on Environmental Quality v. EPA*). We understand that the litigation outcome and potential subsequent rulemaking by EPA concerning Wise County are unknown at this time. Although we appreciate the commission's dilemma, if Wise County is no longer designated as nonattainment in the future, a publication by the commission in the Texas Register that Wise County is no longer designated nonattainment is not sufficient to change the applicability of requirements to sources in Wise County. Under CAA Section 110(i), this change would require a SIP revision submitted by TCEQ after completion of the State's rulemaking process.

   Phrasing similar to that quoted above occurs in multiple places throughout this proposed SIP revision and must also be revised:

   Subchapter B, General Volatile Organic Compounds Sources, Division 1: Storage of VOCs, §115.119(h), Compliance Schedules.

   Subchapter B, General Volatile Organic Compounds Sources, Division 2: Vent Gas Control, §115.129(g), Compliance Schedules.

   Subchapter B, General Volatile Organic Compounds Sources, Division 3: Water Separation, §115.139(e), Counties and Compliance Schedules.

   Subchapter C, Volatile Organic Compound Transfer Operations, Division 1: Loading and Unloading of Volatile Organic Compounds, §115.219(g) Counties and Compliance Schedules. Subchapter C, Volatile Organic Compound Transfer Operations, Division 2: Filling of Gasoline Storage Vessels (Stage 1) for Motor Vehicle Fuel Dispensing Facilities, §115.229(f) Counties and Compliance Schedules.

Subchapter C, Volatile Organic Compound Transfer Operations, Division 3: Control of Volatile Organic Compound Leads from Transport Vessels, §115.239(e) Counties and Compliance Schedules.

Subchapter D, Petroleum Refining, Natural Gas Processing, and Petrochemical Processes, Division 3: Fugitive Emission Control in Petroleum Refining, Natural Gas/Gasoline Processing, and Petrochemical Processes in Ozone Nonattainment Areas, §115.359(e) Counties and Compliance Schedules.

Subchapter E, Solvent-Using Processes, Division 2: Surface Coating Processes, §115.429(f) Counties and Compliance Schedules.

Subchapter E, Solvent-Using Processes, Division 4: Offset Lithographic Printing, §115.449(i) Counties and Compliance Schedules.

Subchapter E, Solvent-Using Processes, Division 5: Control Requirements for Surface Coating Processes, §115.459(d) Counties and Compliance Schedules.

Subchapter E, Solvent-Using Processes, Division 6: Industrial Cleaning Solvents, §115.469(d) Counties and Compliance Schedules.

Subchapter E, Solvent-Using Processes, Division 7: Miscellaneous Industrial Adhesives, §115.479(d) Compliance Schedules.

Subchapter F, Miscellaneous Industrial Sources, Solvent-Using Processes Division 1: Cutback Asphalt, §115.519(e) Compliance Schedules.

3. Definition of Dallas-Fort Worth area (Subchapter A Definitions, §115.10 (11))

The definition of the "Dallas-Fort Worth area" has been revised to refer to 3 different designations depending on the definition's applicability and based on the number of counties.

For clarity, we suggest creating three distinct definitions, such as (A) "Dallas-Fort Worth area, 4 counties," (B) "Dallas-Fort Worth area, 9 counties" and (C) "Dallas-Fort Worth area, 10 counties" so that the terms used in the subchapters and divisions provide information about which definition is intended. As currently proposed, the definition requires a person to cross reference particular subchapters and divisions with the definition section to determine what counties "Dallas Fort Worth area" includes in that context.

Alternatively, or possibly in addition, we suggest clarifying the definition of Dallas-Fort Worth area as it applies to a particular subchapter.

An example of a reference which is somewhat problematic may be found in Subchapter C, Volatile Organic Compound Transfer Operations, Division 1: Loading and Unloading of Volatile Organic Compounds (Subchapter C, §115.219(f) Counties and Compliance Schedules). Reviewing the definition of Dallas-Fort Worth in §115.10, this subchapter is not specifically delineated in definition (A) or (B), therefore it seems that the applicable definition is (C) for all 10 counties. However, in §115.219(f), we believe TCEQ intended this reference to the DFW area to include only 9 counties (§115.10(11)(B)) because there is a separate paragraph that provides requirements for Wise County, §115.219(e). There are additional instances similar to this throughout the revisions.

Project Number 2013-014-SIP-NR

Comments Addressing the Dallas-Fort Worth Reasonable Further Progress SIP Revision

We appreciate the detailed work submitted in the RFP plan. It appears that the RFP and contingency reductions are available, but not always shown accurately. We found mathematical errors in several tables. For example, in Table 3-12 (Post-2011 RFP Target level of VOC emission for Wise County), page 3-12 of the submittal: the VOC target for the 2018 attainment year would be 28.29 tpd (29.33 – 1.04 = 28.29), but Table 3-12 shows 28.30 tpd. This error is also reflected in Table 3-16, line 9 and in Appendix 1, on Sheet 16. There also appears to be an error made in calculating the creditable RFP control reductions in NOx for the nine previously designated counties between 2017 and 2018, shown on line 3 of Table 3-15. The sum of NOx reductions projected for 2017 is 864.23 (Table 4-1) and the sum of NOx reductions projected for 2018 is 901.79 (Table 4-2). The difference between these two sums is 37.56, but Table 3-15 shows 14.42. Please indicate where the additional 23.14 tpd in NOx emission reductions has been placed (37.56 – 14.42 = 23.14). We did not find errors in such calculations for the VOC emission reductions.

The titles for Tables 4-23 and 4-24 identify them as providing the RFP contingency demonstrations for the 2017 milestone year, but the dates within the tables are 2018. Additionally, we believe several of the numbers provided in these tables reflect emissions for 2018 rather than for 2017.

The Airport Emissions Inventory – Wise County is within the DFW MSA and has airports, but there is no mention of Wise County within the Airport EI. Wise County had not been proposed as a nonattainment area when the Airport EI was completed (August 2011), but neither had Hunt and Henderson Counties, which are included in the Airport EI. Please explain why Wise County is not included in the Airport EI.

Rule Project Number 2013-049-117-AI

<u>Comments on the Proposed Revisions to 30 TAC Chapter 117</u>

1. Sections 117.210(c), 117.225, 117.405(d), 117.410(d), 117.425, 117.1110(b), 117.1125, 117.1310(b), and 117.1325 pertain to control of ammonia and carbon monoxide emissions which are not ozone precursors, and are therefore not necessary components of Texas ozone SIP. As a result, EPA supports TCEQ for clearly identifying that these sections are not intended for inclusion into the EPA-approved Texas SIP.

2. EPA supports the inclusion of major sources of NOx located in Wise County to become subject to requirements of 30 TAC Chapter 117.

3. At the time of this review, Wise County is currently designated as nonattainment for the 2008 eight-hour ozone standard.

   Section 117.9030(a)(2) states: "Upon the date the commission publishes notice in the *Texas Register* that Wise County is no longer designated nonattainment for the 2008 Eight-Hour Ozone National Ambient Air Quality Standard, the owner or operator of a unit located at a major stationary source of NOX located in Wise County is not required to comply with the requirements of Subchapter B, Division 4 of this chapter." This provision is not approvable as proposed because it does not contain a replicable procedure to change the applicability of a SIP requirement. EPA's designation of Wise County is currently under review in the D.C. Circuit Court of Appeals (*Mississippi Commission on Environmental Quality v. EPA*). We understand that the litigation outcome and potential subsequent rulemaking by EPA concerning Wise County are unknown at this time. Although we appreciate the commission's dilemma, if Wise County is no longer designated as nonattainment in the future, a publication by the commission in the Texas Register that Wise County is no longer designated non-attainment is not sufficient to change the applicability of requirements to sources in Wise County. Under CAA Section 110(i), this change would require a SIP revision submitted by TCEQ after completion of the State's rulemaking process.

ENVIRON

Sierra CLub Ex. 3

MEMORANDUM

To: Pete Breitenbach

From: Edward Tai and Greg Yarwood

Date: June 22, 2006

Subject: Task 19. DFW APCA Run for 2009 with East Texas EGU Controls

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INTRODUCTION

A CAMx source apportionment run examined the impacts from Texas EGUs to the daily maximum 8-hour ozone in the DFW 9-county NAA for the August 13-22, 1999 episode for 2009 after applying three levels of fuel-specific emission controls to the East Texas EGUs within 200 km of DFW.

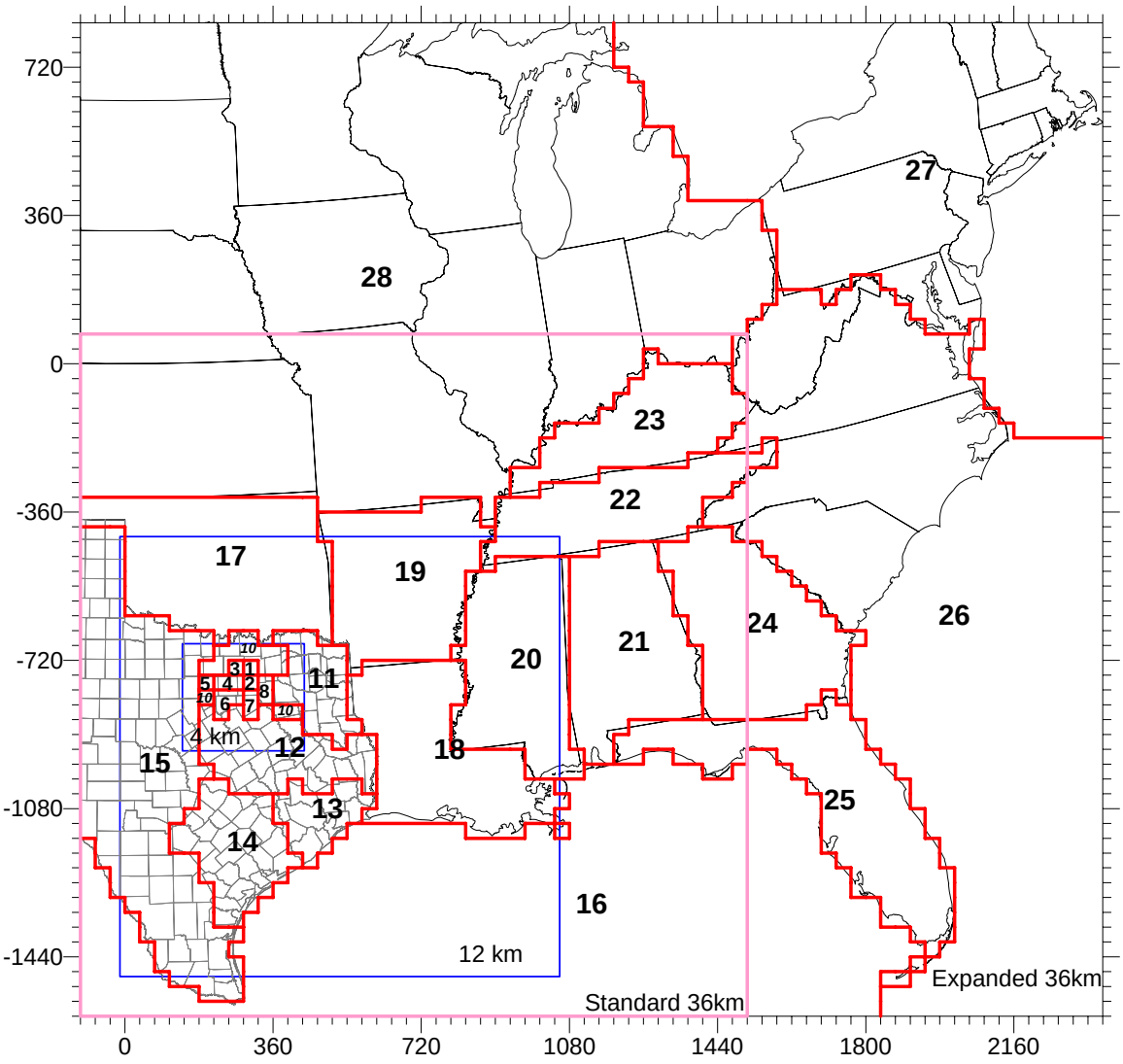
The run (run44.fy2009.a1.et_egu) was based on the Run 44 baseline configuration, with the modeling domain covering the expanded 36 km domain with 14 km model top. Inputs included meteorology from MM5 Run 6, which was based on the ETA PBL scheme coupled with the Noah land surface model, with the kv100 patch applied to the vertical diffusivity. The boundary conditions assigned moderate conditions in the mixed layer over land, and clean conditions over the Gulf, Atlantic and all areas aloft. A modified version of CAMx 4.03 was used in which several NOx recycling reactions were added to the CB4 mechanism (CB4xi).

EMISSIONS

The 2009 East Texas EGU NOx emission rates were reduced to levels shown in Table 1 for each fuel type. NOx was reduced 137 tpd, of which 59 % was in Northeast Texas and 35 % was in Central Texas. VOC emissions were unchanged. Summaries of the 2009 weekday NOx emissions are shown in Table 2 by source region, as defined in Figure 1, and by emission group (biogenics, elevated points, Texas mobile, low points, area, and off-road, and non-Texas low-level anthropogenics). The rightmost column shows the change in emissions from the 2009 baseline.

Table 1. East Texas EGU controlled emission rates

Fuel Type	Emissions [lb NOx/MMBtu]
Lignite	0.08
Other Coal	0.05
Gas	0.03



DFW Source Regions. 36 km Expanded Domain

1. Collin Co.
2. Dallas Co.
3. Denton Co.
4. Tarrant Co.
5. Parker Co.
6. Johnson Co.
7. Ellis Co.
8. Kaufman Co.
9. Rockwall Co.
10. DFW 16-County
11. NE Texas
12. Central Texas
13. Houston
14. South Texas
15. West Texas
16. Gulf of Mexico + Mexico
17. Oklahoma
18. Louisiana
19. Arkansas
20. Mississippi
21. Alabama
22. Tennessee
23. Kentucky
24. Georgia
25. Florida
26. Mid Atlantic States
27. Northeast US
28. Northern Plains

Figure 1. Map of source regions in the 36 km expanded domain.

Table 2. Weekday NOx emissions in 2009 with East Texas EGU controls.

NOX [tpd]	Bio	TX Mobile	Elev Points	TX Low Points	TX Area	TX Offroad	Non-TX Low Anthro	All Anthro	Anthro Change from 2009 baseline
Collin Co	10	15	1	0	2	8	0	25	-0.4
Dallas Co	4	77	5	2	18	45	0	148	-1.0
Denton Co	8	17	1	0	12	9	0	40	0.0
Tarrant Co	3	46	2	2	10	28	0	89	0.0
Parker Co	1	6	1	0	1	2	0	10	0.0
Johnson Co	5	5	6	0	0	5	0	16	0.0
Ellis Co	15	9	35	1	0	6	0	51	0.0
Kaufman Co	5	6	3	0	0	2	0	12	-0.6
Rockwall Co	2	3	0	0	0	1	0	5	0.0
DFW 9-County	**52**	**184**	**53**	**6**	**44**	**107**	**0**	**394**	**-2.0**
DFW 16 County	**83**	**212**	**76**	**10**	**67**	**123**	**0**	**488**	**-3.5**
NE Texas	16	79	108	16	71	42	1	316	-81.3
Central TX	113	88	90	2	56	69	0	305	-47.7
Houston	21	175	282	12	53	63	0	585	0.0
South TX	229	189	262	22	75	100	0	648	-4.9
West TX	524	160	154	21	212	105	1	653	0.0
Texas	**986**	**904**	**971**	**83**	**534**	**501**	**2**	**2995**	**-137.4**
Gulf + Mexico	79	5	437	0	4	2	444	892	0.0
Oklahoma	227	1	256	0	2	3	661	924	0.0
Louisiana	106	1	715	2	2	1	1183	1905	0.0
Arkansas	125	2	220	0	0	2	468	692	0.0
Mississippi	121	0	353	0	0	0	455	808	0.0
Alabama	75	0	442	0	0	0	491	932	0.0
Tennessee	118	0	244	0	0	0	662	906	0.0
Kentucky	145	0	289	0	0	0	770	1060	0.0
Georgia	110	0	408	0	0	0	823	1230	0.0
Florida	56	0	367	0	0	0	1206	1573	0.0
Mid Atlantic (SC, NC, VA, WV)	293	0	977	0	0	0	2332	3310	0.0
NE US	314	0	1302	0	0	0	5748	7051	0.0
Northern Plains	5238	0	3269	0	0	0	8623	11892	0.0
Total	**7992**	**913**	**10252**	**85**	**543**	**509**	**23869**	**36170**	**-137.4**
Total change from baseline	**0.0**	**0.0**	**-137.4**	**0.0**	**0.0**	**0.0**	**0.0**	**-137.4**	

The Texas EGUs were separated into 13 emission groups. The first nine groups consisted of the nine highest-emitting EGUs in East Texas, which accounted for 85 % (117 tpd) of the total NOx reduction. The remaining Texas EGUs were separated into four groups: EGUs inside the DFW 9-county NAA, EGUs within 100 km of DFW (and outside the DFW NAA), EGUs within 200km of DFW (but outside 100 km), and all other Texas EGUs. Table 3 summarizes the weekday NOx for each EGU group and Figure 2 plots the change in weekday NOx from the EGU controls, color-coded by emissions group.

All other emissions were divided into 3 additional source groups: (1) biogenics, (2) Texas non-EGU anthropogenic sources, and (3) all anthropogenic emissions outside of Texas.

Table 3. 2009 weekday NOx from Texas EGUs and differences from the 2009 baseline.

	NOx [tpd]	**Change from baseline [tpd]**	**Change [%]**
Martin Lake	24.1	-23.4	-49%
Monticello	18.1	-21.9	-55%
Limestone	15.2	-23.5	-61%
Welsh	8.3	-21.6	-72%
Big Brown	11.5	-9.1	-44%
Pirkey	6.6	-7.4	-53%
Sandow	4.3	-6.0	-58%
TK Gibbons Cr	2.5	-4.3	-63%
TNP One	6.6	0.0	0%
DFW 9-County EGUs	7.3	-2.0	-22%
EGUs within 100km	6.9	-6.6	-49%
EGUs within 200 km	9.7	-11.5	-54%
Other TX EGUs	264.4	0.0	0%

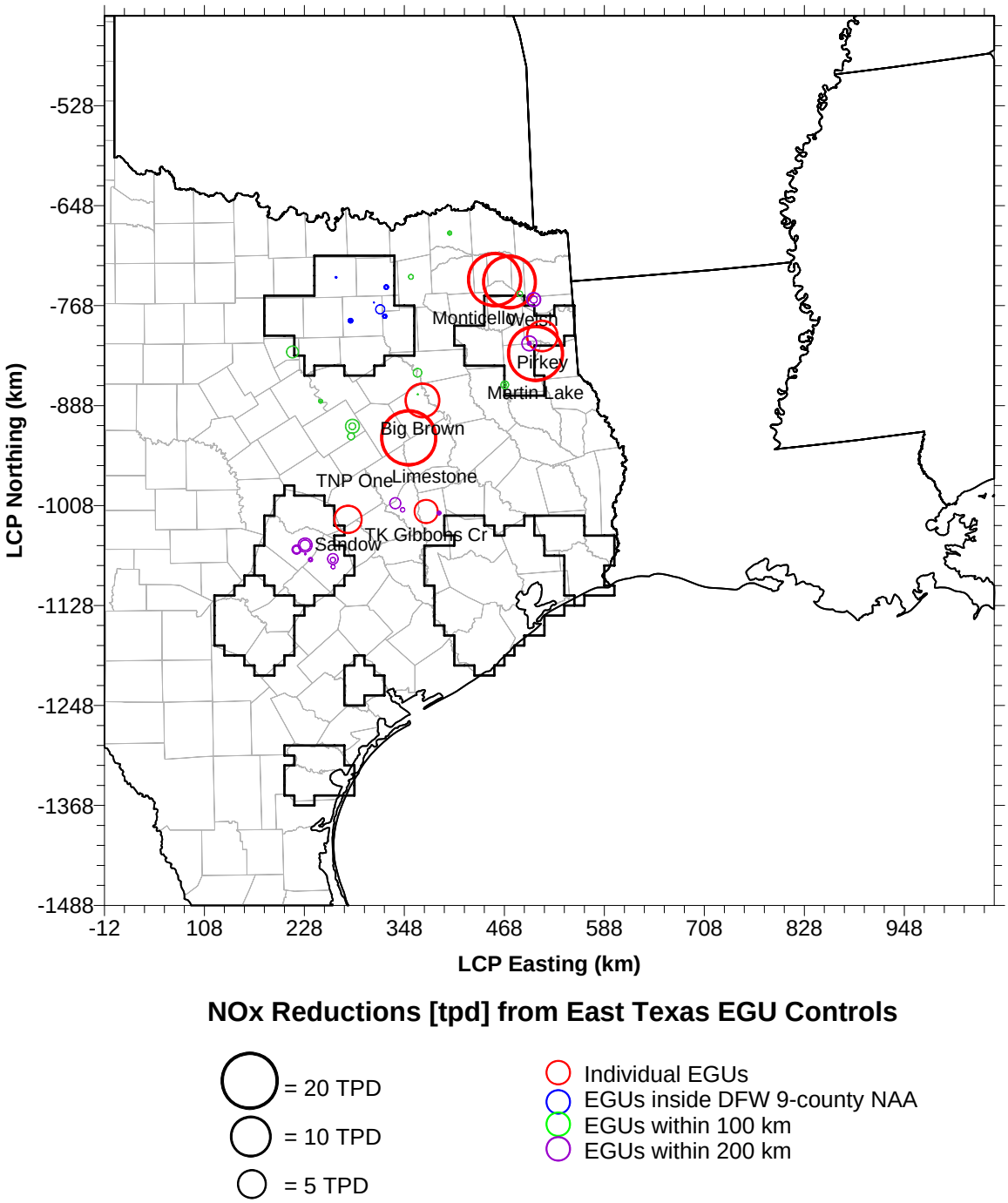


Figure 2. Change in weekday NOx emissions from East Texas EGU controls.

MODELING RESULTS

Figure 3 displays spatial plots of the daily maximum 8-hour ozone (left) and differences from the 2009 baseline (right) for each episode date in the DFW 4 km domain. On two of the three dates with an east wind (August 15 and 21), the DFW 9-county NAA was surrounded by a plume of ozone reduction in northern DFW with origins near the Monticello and Welsh EGUs, and a plume in southern DFW with origins near the Pirkey and Martin Lake EGUs. On dates with a south wind (particularly August 17), ozone reduction was strongest in southern DFW, mainly due to the NOx controls at the Big Brown and Limestone EGUs. Changes to the daily maximum 8-hour ozone in DFW on the two north wind dates (August 19 and 20) were very small.

The 8-hour ozone future design value calculations for the East Texas EGU control scenario are shown in Table 4 for all DFW monitoring sites using the 1999 baseline design value. Daily relative reduction factors are included at the bottom of the table. Table 5 compares the future design values with the 2009 baseline.

The two monitors in southern DFW showed the greatest future design value reduction from the East Texas EGU controls; Midlothian and Arlington dropped 1.5 and 1.0 ppb, respectively. Future design values at all other monitors were 0.5 to 0.8 ppb lower. Frisco's future design value was reduced 0.8 ppb to 90.5 ppb; Denton was 0.6 ppb lower at 89.0 ppb.

Tables 6 to 8 examine the 4-km grid cells in the DFW 9-county NAA in which the daily maximum 8-hour ozone exceeded 85 ppb. Table 6 lists the number of unique grid cells in DFW that exceed 85 ppb for each date in the 2009 baseline and control scenario; the percent change in exceedance area is shown in the right column. For the episode, the East Texas EGU controls reduced the exceedance area by 6 %.

Table 7 shows the number of baseline exceedance cells that were reduced by at least 1 ppb from the EGU controls. Of the 1199 exceedance cells in the episode, 201 (17 %) were reduced at least 1 ppb, all taking place on dates with an east wind or on August 17.

Table 8 sums the number of ppb's in the daily maximum 8-hour ozone that exceed 85 ppb. For example, if the daily maximum ozone in a grid cell is 90 ppb, the grid cell adds 5 ppb (90 – 85 ppb) to the sum of ozone exceedances. The number of exceedance ppb's among all episode dates was reduced 8 %.

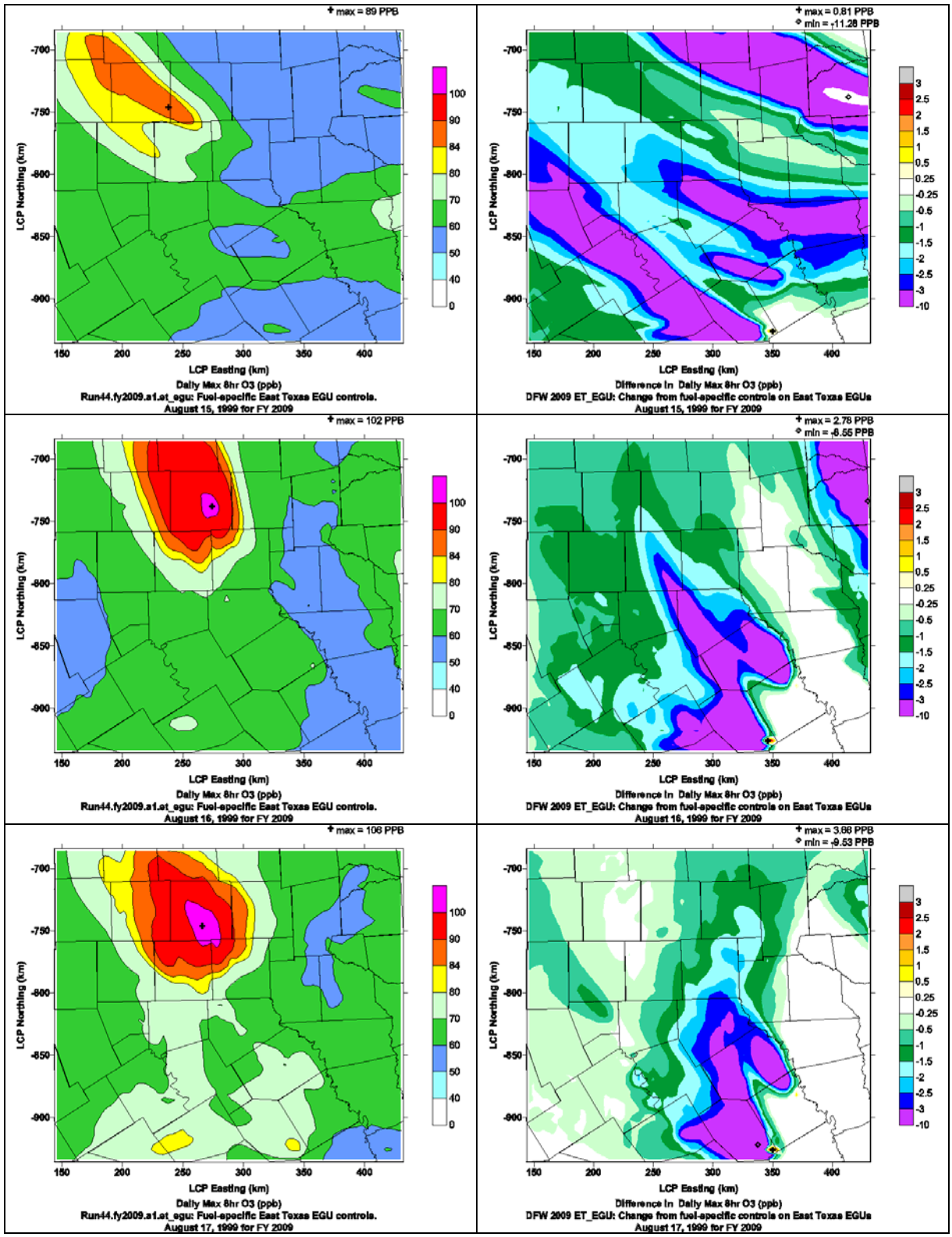


Figure 3. Plots of the daily maximum 8-hour ozone (left) and differences from the 2009 baseline (right) for the fuel-specific East Texas EGU controls scenario.

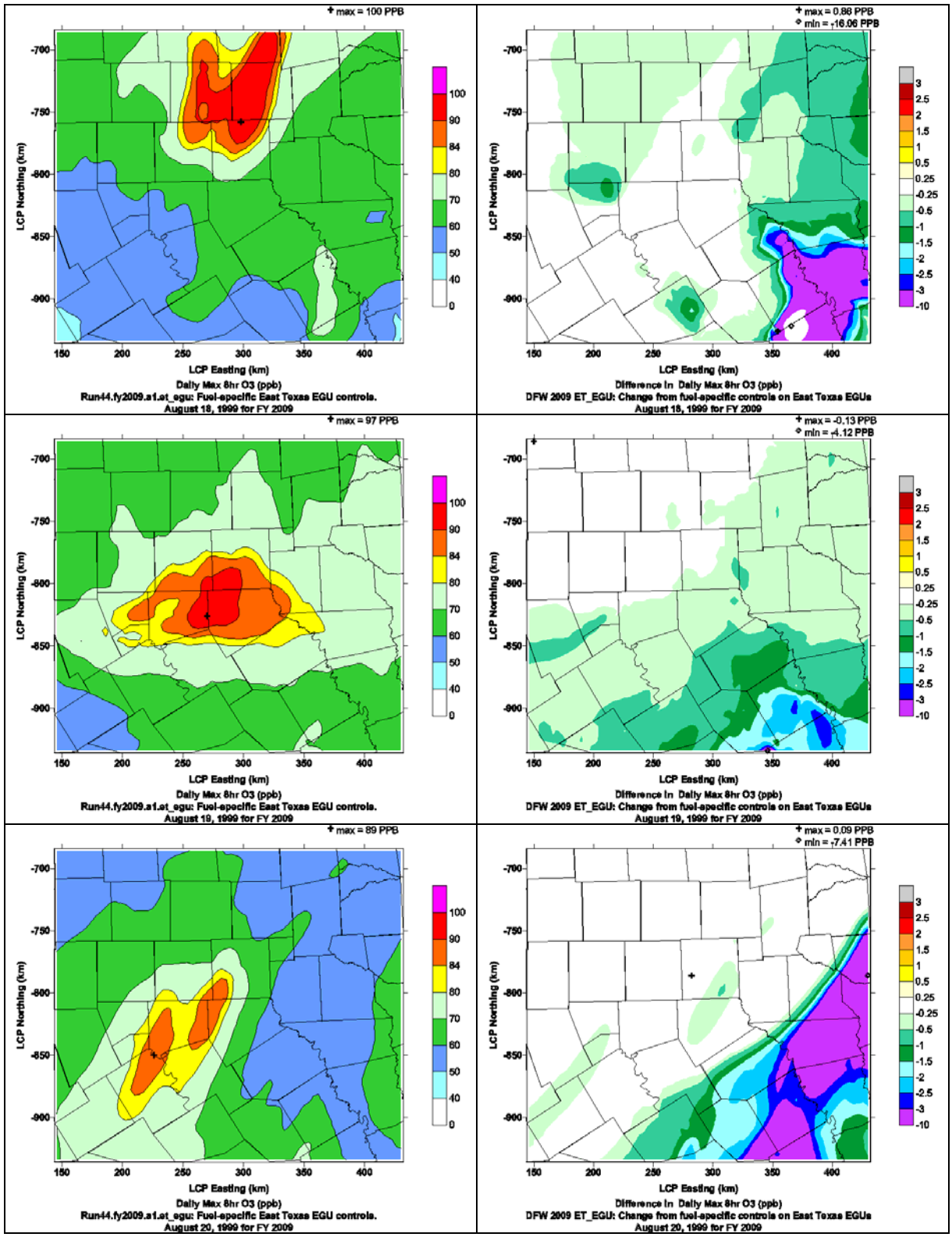


Figure 3. (continued). Plots of the daily maximum 8-hour ozone (left) and differences from the 2009 baseline (right) for the fuel-specific East Texas EGU controls scenario.

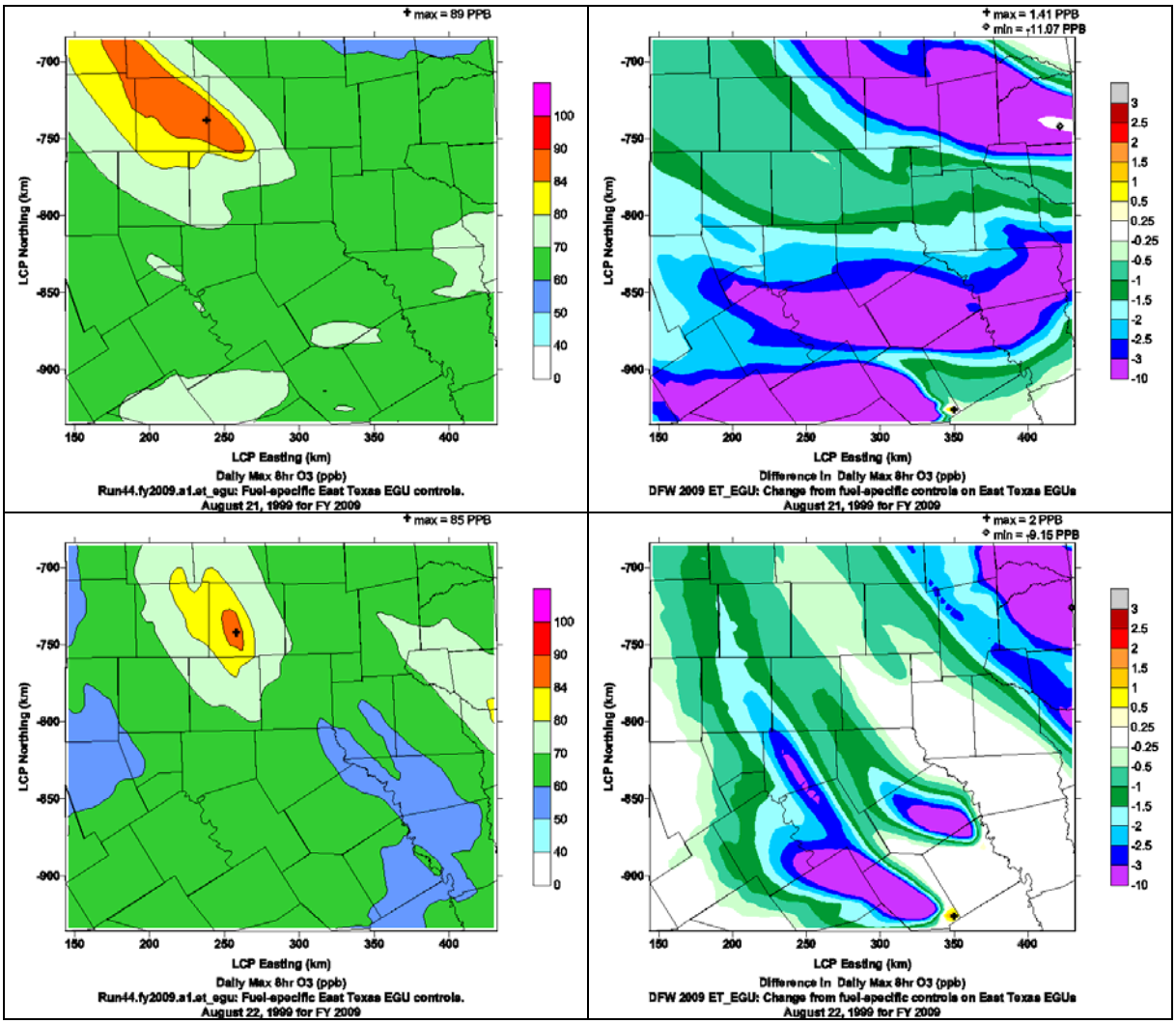


Figure 3. (concluded). Plots of the daily maximum 8-hour ozone (left) and differences from the 2009 baseline (right) for the fuel-specific East Texas EGU controls scenario.

Table 4. Design value calculation for the East Texas EGU control scenario.

Base Case: run44												
Site	**990815**	**990816**	**990817**	**990818**	**990819**	**990820**	**990821**	**990822**	**Average**	**#Days>70**		
Frisco	80.7	105.6	99.0	104.9	85.6	70.0	85.9	89.4	90.1	8		
Dallas C60	83.2	98.1	100.6	102.8	96.7	77.4	86.0	85.1	91.2	8		
North Dallas C63	82.8	99.6	99.0	104.7	94.0	76.0	86.0	87.5	91.2	8		
Dallas C402	78.3	92.9	98.0	98.3	104.7	84.7	80.5	80.6	89.7	8		
Denton	102.4	110.5	108.5	113.0	83.9	72.4	101.6	100.1	99.0	8		
Midlothian	75.5	85.0	86.2	78.0	111.8	89.6	75.0	74.9	84.5	8		
Arlington	86.3	98.3	99.6	94.5	104.5	84.2	81.8	86.6	92.0	8		
Fort Worth C13	94.2	105.4	102.6	104.2	94.9	79.9	90.9	91.9	95.5	8		
Fort Worth C17	100.4	110.1	107.6	106.8	92.3	77.9	95.1	97.3	98.4	8		
Future Year: run44.fy2009.a1.apca.et_egu												
Site	**990815**	**990816**	**990817**	**990818**	**990819**	**990820**	**990821**	**990822**	**Average**	**RRF[1]**	**Baseline DV [ppb]**	**Future DV[2] [ppb]**
Frisco	67.2	99.2	99.6	98.2	72.9	64.9	73.6	75.0	81.3	0.902	100.3	90.5
Dallas C60	72.2	92.0	101.4	99.4	89.2	82.7	78.1	74.8	86.2	0.945	92.0	86.9
North Dallas C63	70.2	94.7	99.6	99.8	83.7	78.8	76.8	73.9	84.7	0.929	93.0	86.4
Dallas C402	66.7	81.0	89.4	88.0	95.4	87.6	71.6	69.7	81.2	0.905	87.3	79.0
Denton	87.1	101.5	106.1	91.9	70.8	64.1	88.9	84.8	86.9	0.877	101.5	89.0
Midlothian	67.9	72.6	77.3	70.4	97.1	87.0	67.0	67.3	75.8	0.898	92.5	83.1
Arlington	72.1	88.1	90.8	83.4	94.1	87.6	73.6	78.5	83.5	0.908	95.0	86.3
Fort Worth C13	79.5	93.1	93.3	88.0	83.5	76.5	79.9	80.8	84.3	0.883	98.3	86.8
Fort Worth C17	87.4	96.4	102.1	90.4	79.5	71.0	87.3	84.1	87.3	0.887	96.3	85.4
Daily RRFs[3]												
Site	**990815**	**990816**	**990817**	**990818**	**990819**	**990820**	**990821**	**990822**				
Frisco	0.833	0.939	1.006	0.935	0.852	0.926	0.857	0.839				
Dallas C60	0.868	0.937	1.008	0.967	0.922	1.068	0.909	0.879				
North Dallas C63	0.848	0.951	1.005	0.953	0.891	1.037	0.892	0.845				
Dallas C402	0.852	0.873	0.912	0.896	0.911	1.033	0.890	0.865				
Denton	0.851	0.918	0.978	0.814	0.844	0.886	0.874	0.847				
Midlothian	0.899	0.855	0.897	0.903	0.869	0.971	0.894	0.898				
Arlington	0.836	0.896	0.912	0.883	0.900	1.040	0.900	0.906				
Fort Worth C13	0.844	0.883	0.909	0.844	0.880	0.958	0.879	0.879				
Fort Worth C17	0.870	0.876	0.949	0.847	0.862	0.912	0.918	0.864				

(1) RRF = Future year average / base year average
(2) Future DV = Baseline DV * RRF
(3) Daily RRFs are for information only and are not used to calculate the future DVs.

Table 5. Summary of future design values.

Run	run44.fy2009.a1	run44.fy2009.a1.et_egu	
Scenario	**2009 baseline**	**3 levels of fuel-specific emissions to ET EGUs within 200 km of DFW NAA**	**Difference from 2009 baseline [ppb]**
Frisco	91.2	90.5	-0.8
Dallas C60	87.6	86.9	-0.6
Dallas C63	87.0	86.4	-0.6
Dallas C402	79.7	79.0	-0.7
Denton	89.6	89.0	-0.6
Midlothian	84.5	83.1	-1.5
Arlington	87.2	86.3	-1.0
Fort Worth C13	87.6	86.8	-0.8
Fort Worth C17	86.0	85.4	-0.5

Table 6. Exceedance Area (Number of grid cells in the DFW NAA with daily maximum 8-hour ozone > 85 ppb)

Run	run44.fy2009.a1	run44.fy2009.a1.et_egu	Difference [%}
Scenario	**2009 baseline**	**3 levels of fuel-specific emissions to ET EGUs within 200 km of DFW NAA**	
990815	19	13	-32%
990816	223	211	-5%
990817	296	279	-6%
990818	253	247	-2%
990819	304	286	-6%
990820	70	68	-3%
990821	29	25	-14%
990822	5	0	-100%
Total	1199	1129	-6%

Table 7. Number of exceedance grid cells reduced at least 1 ppb.

Run Scenario	run44.fy2009.a1.et_egu 3 levels of fuel-specific emissions to ET EGUs within 200 km of DFW NAA
990815	19
990816	136
990817	40
990818	0
990819	0
990820	0
990821	6
990822	0
Total	201

Table 8. Number of ppb's exceeding 85 ppb[1] in the daily maximum ozone in DFW NAA.

Run	run44.fy2009.a1	run44.fy2009.a1.et_egu
Scenario	2009 baseline	3 levels of fuel-specific emissions to ET EGUs within 200 km of DFW NAA
990815	50	25
990816	2184	1916
990817	2594	2424
990818	1660	1598
990819	1201	1101
990820	84	79
990821	74	52
990822	1	0
Total	7846	7194
% Difference		-8.3 %

1 Σ(max(O3-85, 0.0))

SOURCE APPORTIONMENT RESULTS

The APCA source apportionment modeling results focused on contributions to the two ozone monitoring sites with the highest 8-hour ozone future design values – Frisco and Denton. Impacts from each emissions group to the daily maximum 8-hour ozone within the 7 by 7 cells surrounding each monitor were examined, corresponding to the values used for design value scaling.

Contributions to Frisco

Table 9 lists contributions from each of the 9 large EGUs in East Texas to the daily maximum 8-hour ozone near Frisco for the 2009 baseline (top) and EGU controls (center). The change in contributions, expressed as a percentage, is shown at the bottom of the table. The highest contributions in the control scenario were from the same EGUs and dates as in the baseline, but were much smaller. All contributions greater than 0.2 ppb from the individual EGUs occurred on dates with east winds: Martin Lake (0.36 ppb) and Pirkey (0.21 ppb) on August 15, Big Brown (0.40 ppb) on August 16, and Welsh (0.31 ppb) and Monticello (0.24 ppb) on August 21.

The percent change in ozone contributions to Frisco from the East Texas control scenario showed little variation from day to day from each of the large EGUs, as shown in Figure 4. Percentages were not plotted when the baseline contribution was less than 0.001 ppb. In Figure 5, the episode average change in ozone contributions to Frisco from each of the large EGUs is compared to each EGU's change in NOx emissions. EGUs that reduced more NOx, by percent, reduced nearly the same percentage of their 8-hour ozone contributions to Frisco.

A summary of contributions to the daily maximum 8-hour ozone near Frisco from all sources is listed in Table 10 and displayed as a stacked bar chart for all episode dates in Figure 6. The

largest contribution from all Texas EGUs combined was 1.9 ppb on August 16, down from 3.1 ppb in the 2009 baseline. On the three dates exceeding 85 ppb (August 16- 18), the Texas non-EGU anthropogenic source group contributed over 40 ppb to Frisco's peak 8-hour ozone; on the remaining dates, contributions were nearly halved.

Table 9. Contributions [ppb] from the 9 large EGUs to the daily maximum 8-hour ozone near Frisco for the baseline (top) and East Texas EGU control scenario (center), with differences in percent (bottom).

2009 Baseline										
Source	**15-Aug**	**16-Aug**	**17-Aug**	**18-Aug**	**19-Aug**	**20-Aug**	**21-Aug**	**22-Aug**	**Average**	
Martin Lake	0.80	0.34	0.09	0.02	0.04	0.00	0.04	0.22	0.19	
Monticello	0.02	0.03	0.00	0.00	0.02	0.00	0.54	0.01	0.08	
Limestone	0.00	0.40	0.50	0.07	0.12	0.00	0.00	0.01	0.14	
Welsh	0.18	0.04	0.00	0.00	0.02	0.00	1.22	0.01	0.18	
Big Brown	0.00	0.77	0.36	0.01	0.03	0.00	0.00	0.13	0.16	
Pirkey	0.48	0.09	0.02	0.00	0.01	0.00	0.06	0.03	0.09	
Sandow	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.02	
Gibbons Cr.	0.00	0.00	0.02	0.11	0.03	0.00	0.00	0.00	0.02	
TNP One	0.00	0.00	0.05	0.03	0.04	0.00	0.00	0.00	0.02	
East Texas EGU controls										
Source	**15-Aug**	**16-Aug**	**17-Aug**	**18-Aug**	**19-Aug**	**20-Aug**	**21-Aug**	**22-Aug**	**Average**	
Martin Lake	0.36	0.18	0.05	0.01	0.02	0.00	0.02	0.11	0.10	
Monticello	0.01	0.02	0.00	0.00	0.01	0.00	0.24	0.00	0.04	
Limestone	0.00	0.13	0.14	0.03	0.05	0.00	0.00	0.01	0.04	
Welsh	0.06	0.01	0.00	0.00	0.01	0.00	0.31	0.00	0.05	
Big Brown	0.00	0.40	0.18	0.00	0.02	0.00	0.00	0.07	0.08	
Pirkey	0.21	0.04	0.01	0.00	0.00	0.00	0.03	0.02	0.04	
Sandow	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.01	
Gibbons Cr.	0.00	0.00	0.01	0.04	0.01	0.00	0.00	0.00	0.01	
TNP One	0.00	0.00	0.04	0.03	0.04	0.00	0.00	0.00	0.02	
Difference (ET EGU - Baseline)	**15-Aug**	**16-Aug**	**17-Aug**	**18-Aug**	**19-Aug**	**20-Aug**	**21-Aug**	**22-Aug**	**Average**	**Emissions reduction**
Martin Lake	-55%	-46%	-43%	-45%	-47%	-50%	-49%	-47%	-51%	-49%
Monticello	-50%	-52%	-44%	-50%	-50%	-55%	-56%	-54%	-55%	-55%
Limestone		-68%	-72%	-53%	-58%	-61%	-64%	-58%	-68%	-61%
Welsh	-67%	-70%	-68%	-67%	-70%	-72%	-75%	-71%	-74%	-72%
Big Brown	-40%	-49%	-50%	-42%	-44%	-40%	-44%	-46%	-49%	-44%
Pirkey	-57%	-52%	-49%	-50%	-51%	-57%	-52%	-51%	-55%	-53%
Sandow		-50%	-38%	-56%	-57%	-50%	-50%	-67%	-57%	-58%
Gibbons Cr.		-65%	-66%	-63%	-62%	-50%	-100%	-63%	-63%	-63%
TNP One		-15%	-4%	0%	0%	0%	0%	0%	-2%	0%

Red values denote contributions > 0.40 ppb in the baseline and > 0.20 ppb in the control scenario.

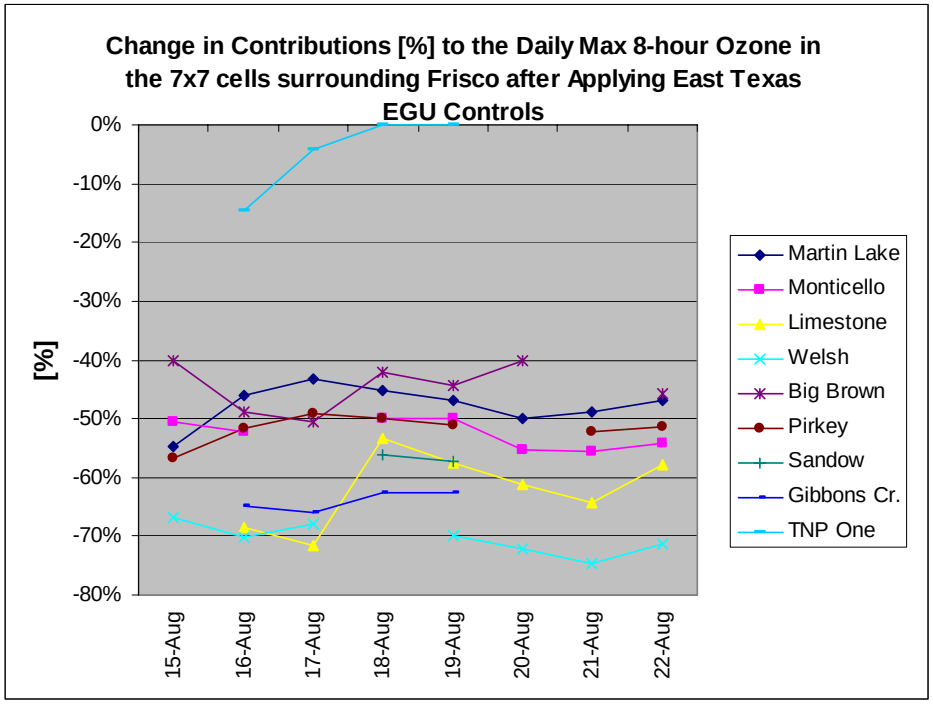


Figure 4. Change in contributions [%] to the daily maximum 8-hour ozone in Frisco from 9 large EGUs in the East Texas EGU control scenario.

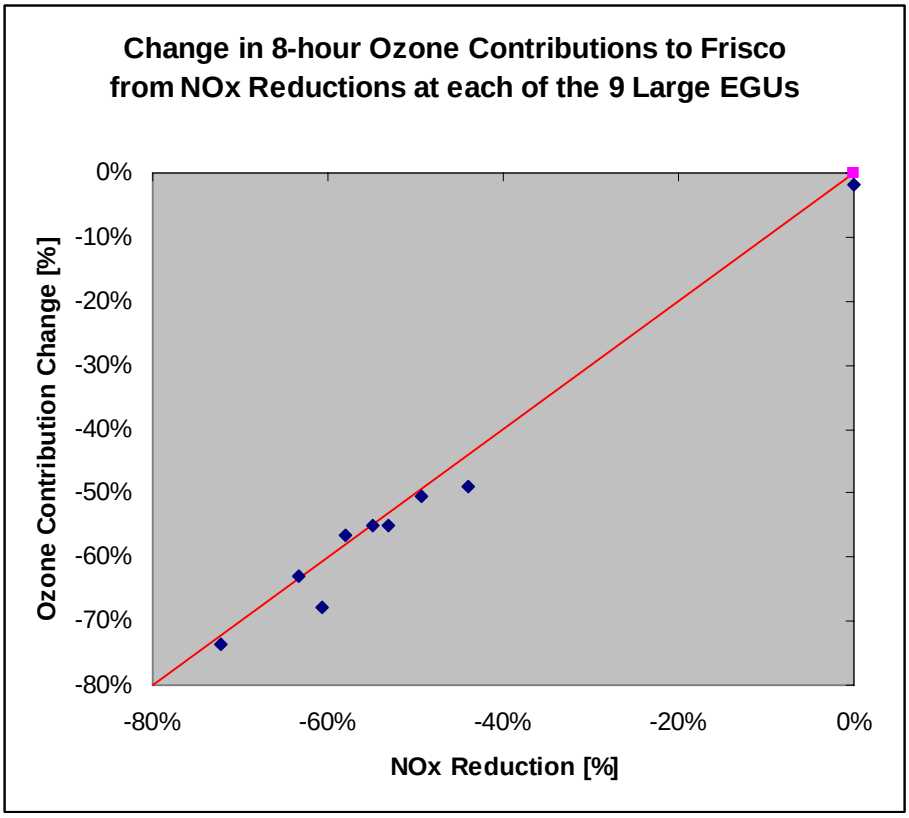


Figure 5. Relationship between the average change in ozone contributions [%] to Frisco and the change in NOx emissions [%] from each large EGU.

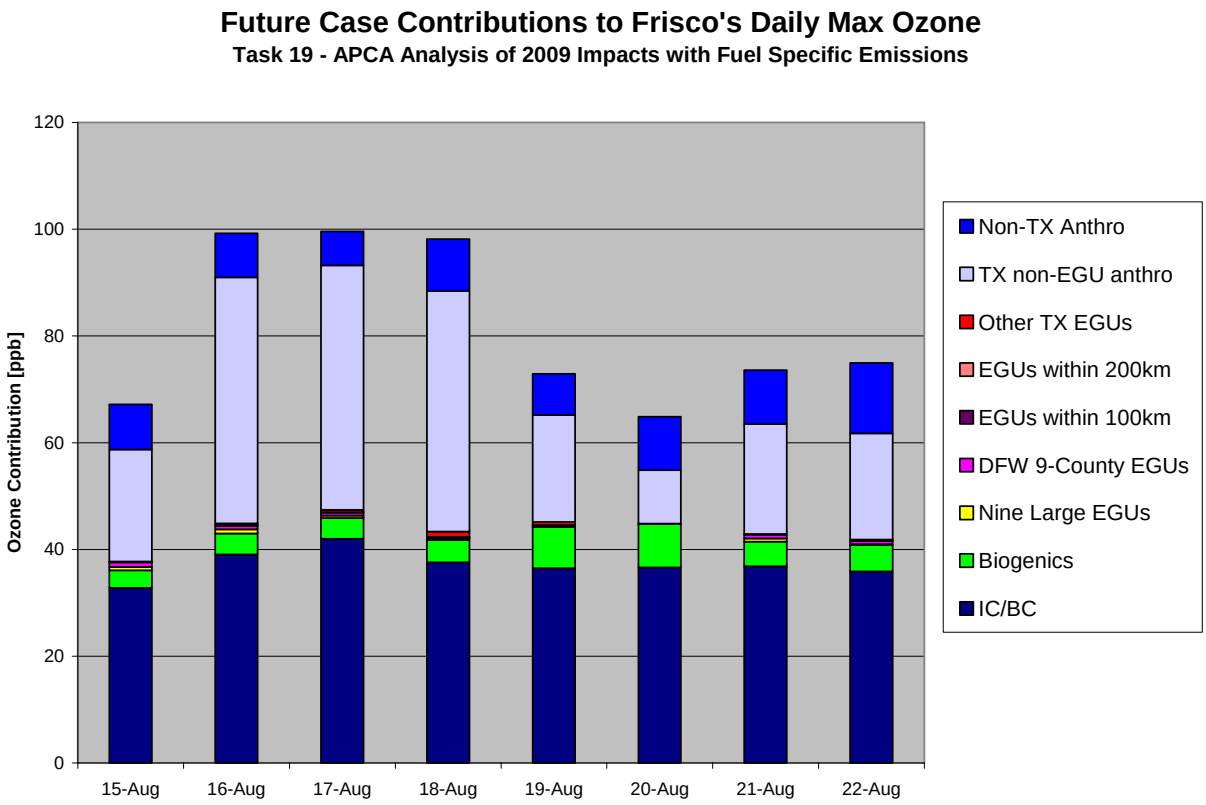


Figure 6. 8-hour ozone contributions to Frisco from all source groups in the East Texas EGU control scenario.

Table 10. Consolidated contributions [ppb] from all sources in the East Texas EGU control scenario to the daily maximum 8-hour ozone near Frisco

Source	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug
IC/BC	32.77	39.05	42.00	37.59	36.47	36.62	36.86	35.91
Biogenics	3.33	3.93	3.91	4.22	7.72	8.15	4.60	4.91
Nine Large EGUs	0.64	0.78	0.43	0.15	0.19	0.00	0.60	0.21
DFW 9-County EGUs	0.85	0.66	0.59	0.35	0.06	0.01	0.72	0.57
EGUs within 100km	0.00	0.04	0.02	0.02	0.09	0.01	0.00	0.01
EGUs within 200km	0.03	0.04	0.02	0.06	0.04	0.00	0.02	0.03
Other TX EGUs	0.11	0.39	0.45	0.99	0.59	0.03	0.09	0.22
All Texas EGUs	**1.63**	**1.91**	**1.51**	**1.57**	**0.97**	**0.05**	**1.43**	**1.04**
TX non-EGU Anthro	20.99	46.09	45.82	45.03	20.04	10.07	20.61	19.92
Non-TX Anthro	8.47	8.23	6.33	9.74	7.73	9.97	10.12	13.17
Total	**67.19**	**99.21**	**99.57**	**98.15**	**72.93**	**64.86**	**73.62**	**74.95**

Contributions to Denton

Table 11 lists contributions from each of the 9 large EGUs in East Texas to the daily maximum 8-hour ozone near Denton in the 2009 baseline (top) and EGU control scenario (center) for each episode date. The change in contributions, expressed as a percentage, is shown at the bottom of the table. The highest contributions in the control scenario were from the same EGUs and dates as in the baseline, but were smaller. On August 15, the Martin Lake (0.69 ppb) and Pirkey (0.29 ppb) EGUs were strongest. The Big Brown (0.28 ppb) and Limestone (0.40 ppb) EGUs were largest on August 16, the Welsh EGU (0.20 ppb) was highest on August 21, and the Big Brown EGU contributed another 0.25 ppb on August 22.

Like Frisco, the percent change in ozone contributions to Denton from the NOx reductions at each of the large EGUs did not show significant variations from day to day, as shown in Figure 7. The episode average 8-hour ozone change, expressed as a percent, was almost equal to or greater than the NOx reduction rate at each of the 9 large EGUs, as displayed in Figure 8.

A summary of contributions from all sources to the daily maximum 8-hour ozone near Denton is listed in Table 12 and displayed as a stacked bar chart for all episode dates in Figure 9. The largest contribution from all Texas EGUs combined was 2.3 ppb on August 16, down from 4.1 ppb on the same date in the 2009 baseline. The Texas non-EGU anthropogenic emissions group accounted for 39 % to 49 % of the total ozone when the daily 8-hour ozone peak near Denton exceeded 85 ppb.

Table 11. Contributions from the 9 large EGUs to the daily maximum 8-hour ozone near Denton for the baseline (top) and East Texas EGU control scenario (center), with differences in percent (bottom).

2009 Baseline [ppb]										
Source	**15-Aug**	**16-Aug**	**17-Aug**	**18-Aug**	**19-Aug**	**20-Aug**	**21-Aug**	**22-Aug**	**Average**	
Martin Lake	1.58	0.33	0.08	0.02	0.04	0.00	0.08	0.11	0.28	
Monticello	0.02	0.03	0.00	0.00	0.02	0.00	0.36	0.01	0.06	
Limestone	0.00	0.78	0.41	0.24	0.10	0.00	0.00	0.08	0.20	
Welsh	0.09	0.03	0.00	0.00	0.02	0.00	0.72	0.01	0.11	
Big Brown	0.01	0.61	0.22	0.02	0.02	0.00	0.00	0.55	0.18	
Pirkey	0.70	0.08	0.02	0.00	0.01	0.00	0.08	0.02	0.12	
Sandow	0.00	0.00	0.00	0.18	0.08	0.00	0.00	0.00	0.03	
Gibbons Cr.	0.00	0.01	0.02	0.10	0.03	0.00	0.00	0.00	0.02	
TNP One	0.00	0.01	0.05	0.12	0.04	0.00	0.00	0.00	0.03	
East Texas EGU controls [ppb]										
Source	**15-Aug**	**16-Aug**	**17-Aug**	**18-Aug**	**19-Aug**	**20-Aug**	**21-Aug**	**22-Aug**	**Average**	
Martin Lake	0.69	0.19	0.05	0.01	0.02	0.00	0.04	0.06	0.13	
Monticello	0.01	0.01	0.00	0.00	0.01	0.00	0.17	0.01	0.03	
Limestone	0.00	0.26	0.12	0.11	0.05	0.00	0.00	0.02	0.07	
Welsh	0.03	0.01	0.00	0.00	0.01	0.00	0.20	0.00	0.03	
Big Brown	0.01	0.28	0.11	0.01	0.01	0.00	0.00	0.25	0.08	
Pirkey	0.29	0.04	0.01	0.00	0.01	0.00	0.04	0.01	0.05	
Sandow	0.00	0.00	0.00	0.07	0.03	0.00	0.00	0.00	0.01	
Gibbons Cr.	0.00	0.00	0.01	0.04	0.01	0.00	0.00	0.00	0.01	
TNP One	0.00	0.01	0.05	0.12	0.04	0.00	0.00	0.00	0.03	
Difference (ET EGU - Baseline)										
	15-Aug	**16-Aug**	**17-Aug**	**18-Aug**	**19-Aug**	**20-Aug**	**21-Aug**	**22-Aug**	**Average**	**Emissions Reduction**
Martin Lake	-56%	-43%	-44%	-47%	-41%	-50%	-49%	-41%	-53%	-49%
Monticello	-51%	-51%	-47%	-52%	-42%	-56%	-54%	-58%	-53%	-55%
Limestone	-60%	-67%	-71%	-55%	-54%	-67%	-64%	-76%	-66%	-61%
Welsh	-68%	-71%	-70%	-70%	-66%	-69%	-72%	-73%	-71%	-72%
Big Brown	-44%	-55%	-49%	-43%	-35%	-50%	-44%	-56%	-54%	-44%
Pirkey	-59%	-49%	-49%	-51%	-45%	-57%	-53%	-52%	-57%	-53%
Sandow		-37%	-46%	-58%	-59%	-67%	-50%	-50%	-58%	-58%
Gibbons Cr.		-58%	-65%	-62%	-62%	-50%		-72%	-63%	-63%
TNP One		13%	-4%	0%	0%	0%	0%	-21%	0%	0%

Red values denote contributions > 0.40 ppb in the baseline and > 0.20 ppb in the control scenario.

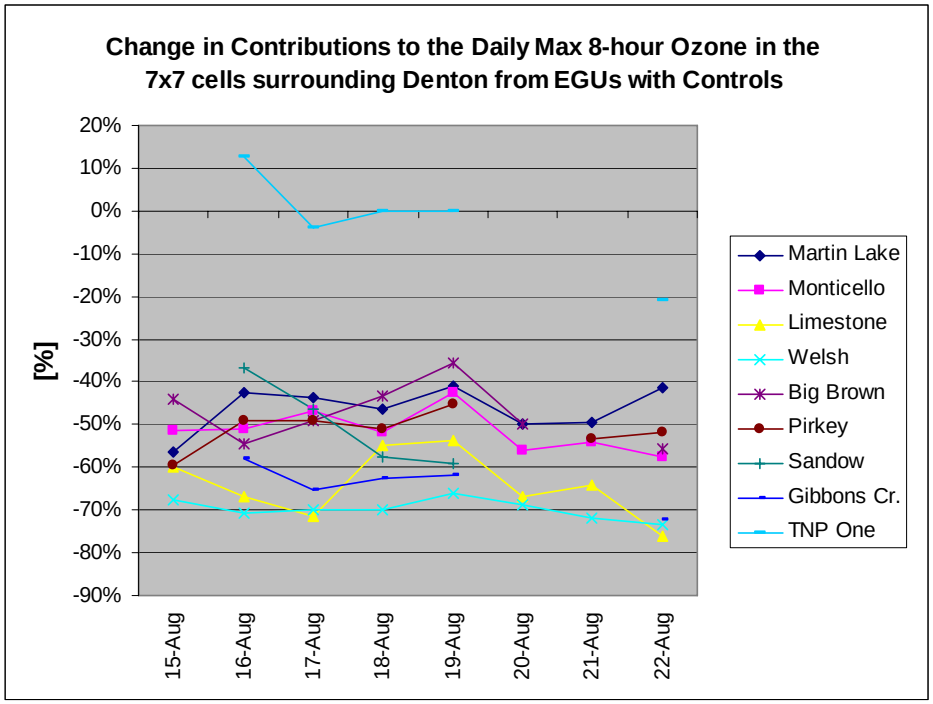


Figure 7. Change in contributions [%] to the daily maximum 8-hour ozone in Denton from 9 large EGUs in the East Texas EGU control scenario.

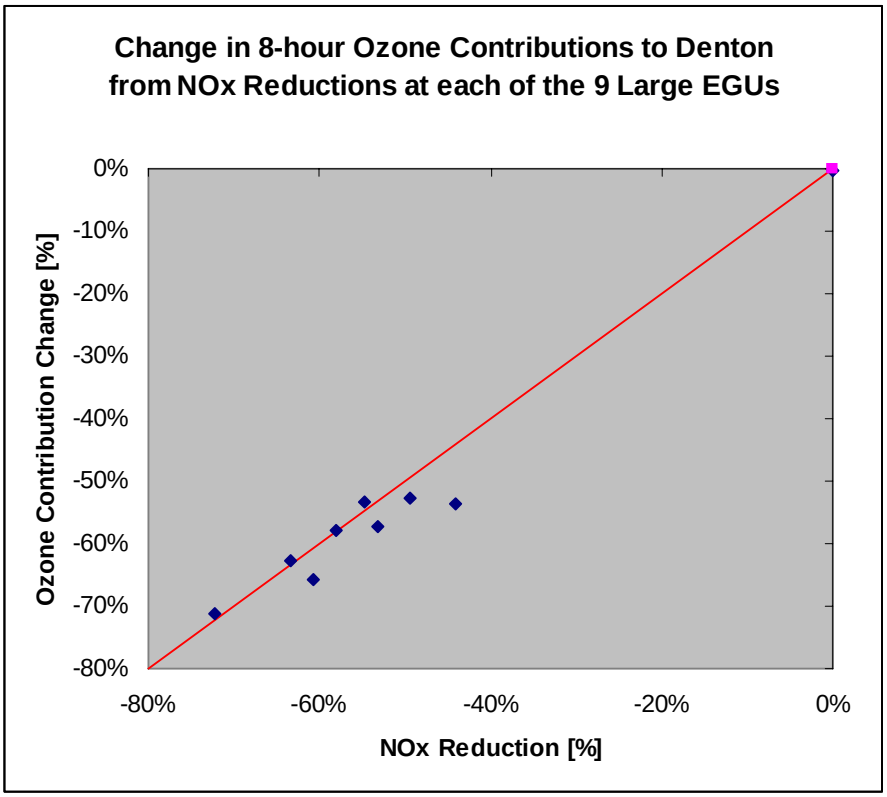


Figure 8. Relationship between the average change in ozone contributions [%] to Denton and the change in NOx emissions [%] from each large EGU.

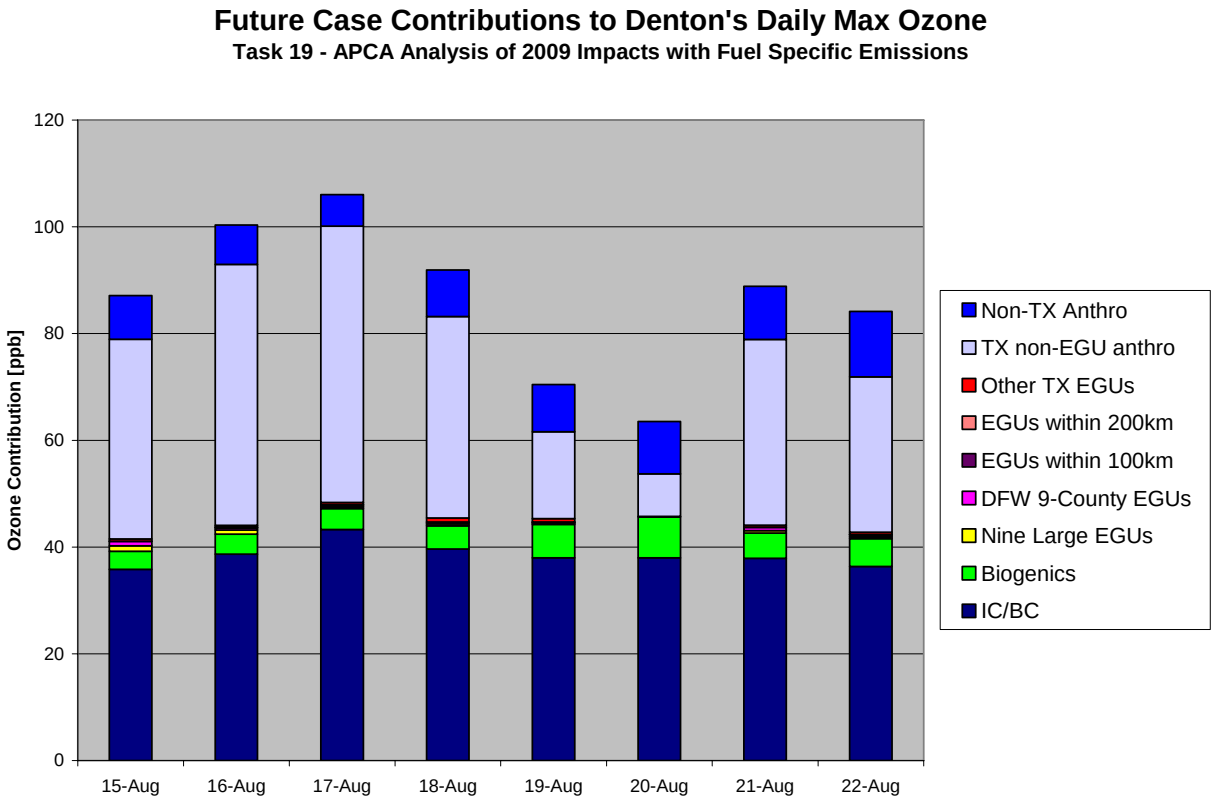


Figure 9. 8-hour ozone contributions to Denton from all source groups in the East Texas EGU control scenario.

Table 12. Consolidated contributions [ppb] from all sources in the East Texas EGU control scenario to the daily maximum 8-hour ozone near Denton.

Source	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug
IC/BC	35.82	38.68	43.27	39.64	38.00	38.01	37.93	36.37
Biogenics	3.39	3.73	3.93	4.36	6.27	7.63	4.68	5.22
Nine Large EGUs	1.02	0.81	0.34	0.36	0.19	0.00	0.45	0.35
DFW 9-County EGUs	0.82	0.40	0.38	0.27	0.15	0.10	0.64	0.37
EGUs within 100km	0.00	0.05	0.02	0.02	0.07	0.00	0.00	0.03
EGUs within 200km	0.04	0.05	0.02	0.07	0.04	0.00	0.03	0.02
Other TX EGUs	0.41	0.34	0.41	0.73	0.61	0.01	0.35	0.41
All Texas EGUs	2.30	1.65	1.17	1.45	1.06	0.12	1.47	1.18
TX non-EGU anthro	37.41	48.90	51.76	37.76	16.28	7.99	34.83	29.12
Non-TX Anthro	8.22	7.37	5.89	8.70	8.83	9.77	9.94	12.24
Total (All sources)	87.14	100.32	106.02	91.91	70.44	63.51	88.85	84.13

SUMMARY

A CAMx source apportionment run examined the 8-hour ozone impacts to DFW when applying three fuel-specific levels of NOx controls to the East Texas EGUs. NOx emissions were reduced 137 tpd, of which 117 tpd (85 %) came from the 9 largest EGUs.

DFW monitors in the south (Midlothian and Arlington) showed the greatest reduction in the 2009 8-hour ozone design values, dropping 1.5 and 1.0 ppb, respectively. The future design values at all other monitors were reduced 0.5 to 0.8 ppb from the 2009 baseline, including Frisco, down 0.8 ppb to 90.5 ppb. The East Texas EGU controls reduced the episode exceedance area by 6 %, as 17 % of the exceedance cells were reduced at least 1 ppb.

A source apportionment analysis separated the Texas EGUs into 13 groups. The first nine groups consisted of the 9 largest individual EGUs in East Texas. The remaining groups represented the EGUs in the DFW 9-county NAA, EGUs within 100 km of DFW, EGUs within 200 km of DFW, and all other EGUs in Texas. Ozone contributions from the 9 individual EGUs to both Frisco and Denton showed that the fractional change in the ozone contributions from each EGU on each date was proportional to the fractional change in the NOx controls.

At Frisco, the largest contribution from the 9 large EGUs combined was 0.8 ppb on August 16, down from 1.7 ppb in the baseline on the same date. At Denton, the EGU controls lowered the ozone contribution from the 9 large EGUs combined from 2.4 ppb to 1.0 ppb on August 15. The largest contributions from all Texas EGUs to Frisco and Denton were 1.9 and 2.3 ppb, respectively.

Sierra Club Ex. 4

North Texas Ozone Attainment Initiative Project

Preliminary Project Results

Mahdi Ahmadi and Kuruvilla John

Department of Mechanical and Energy Engineering

November 6, 2015

UNT UNIVERSITY OF NORTH TEXAS

Scope

1. Replicate DFW SIP runs on UNT Cluster
   - -Base Case and FY18 Case simulations
2. Modeling simulation and analyses for DFW
3. Select major emissions source categories and evaluate its impact on the airshed
4. Evaluate effective ozone control strategies for DFW

Observed Ozone Concentration

TCEQ Report, Aug 2014

(PROTOCOL FOR THE EIGHT-HOUR OZONE MODELING OF THE DALLAS-FORT WORTH AREA, P.46)

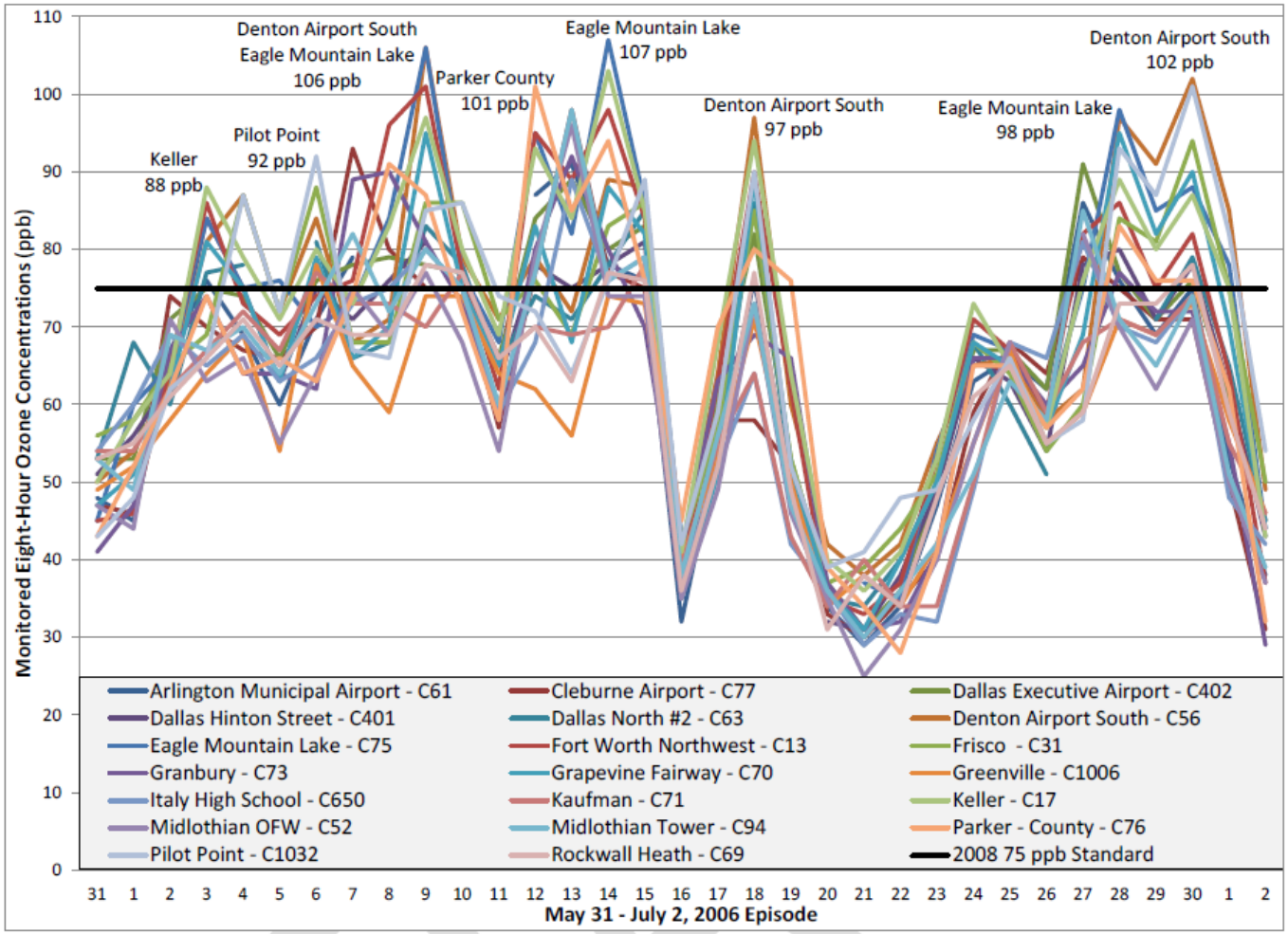


Figure 1-5: Maximum Eight-Hour Ozone by Monitor from May 31 through July 2, 2006

Observed Ozone Concentration

TCEQ Report, Aug 2014

(PROTOCOL FOR THE EIGHT-HOUR OZONE MODELING OF THE DALLAS-FORT WORTH AREA, P.47)

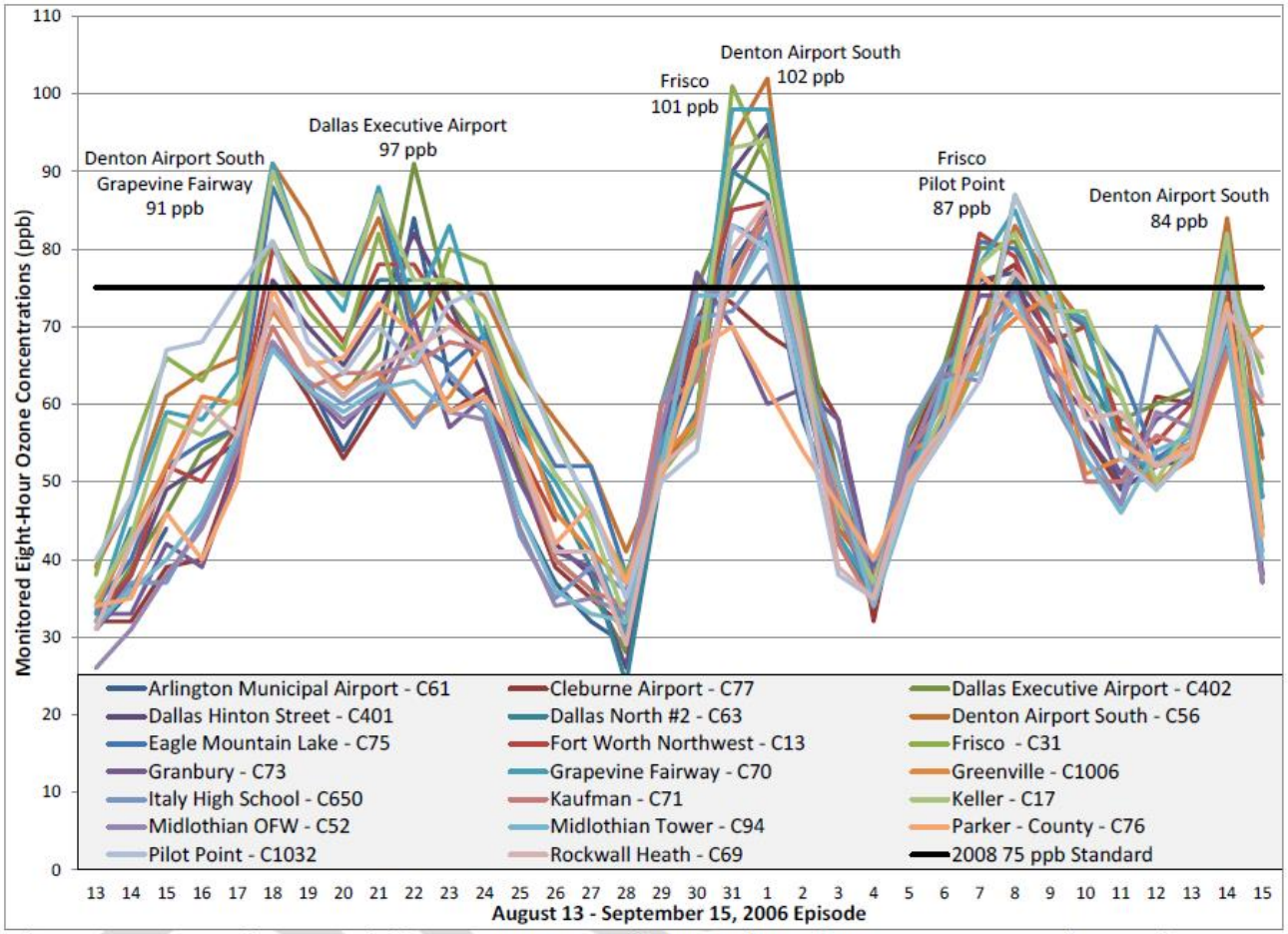


Figure 1-6: Maximum Eight-Hour Ozone by Monitor from August 13 through September 15, 2006

Some Challenges

1. Model runs completed using initial runs from initial SIP submission – *January 2015 files*
   - Results from these are presented here
2. Simulation were re-run using revised SIP submission files – *June 2015 files*
   - Preliminary results provided here
3. Incomplete and sometimes erroneous file sets were uploaded online at the TCEQ repository (but TCEQ cooperated by providing additional information)
4. Sensitivity analyses files online produced mass resolution errors for precursor emissions in CAMx.

Methodology

- Source sensitivity analyses methods
  - Brute force method (BFM): "Zero-Out" scenarios
  - Decoupled Direct Method (DDM and HDDM) much more efficient

- Source apportionment methods
  - Ozone Source Apportionment Technology (OSAT)
  - Anthropogenic Precursor Culpability Assessment (APCA): "The use of APCA instead of OSAT results in more ozone formation attributed to anthropogenic NO_X sources and less ozone formation attributed to biogenic sources. APCA is not really a "source apportionment" technique because it expresses biases as to which sources should be implicated (i.e., those that are controllable), hence it is referred to as a "culpability assessment."*

(*) Kwok, R., Baker, K., Napelenok, S., and Tonnesen., G., "Photochemical grid model implementation and application of VOC, NO x, and O 3 source apportionment." *Geoscientific Model Development* 8, no. 1 (2015): 99-114.

Methodology

- In BFM, the objective is to determine the sensitivity of O_3 to individual sources rather than identify the amount of O_3 produced by particular emission sources.

- BFM results "may be closer to the way the real atmosphere would respond if sufficient inputs are changed, but computing the response to each of the inputs could be very tedious"*
  - However, interpretation of the results must be done with understanding of the limitation of the method

- Typically the BFM has been used as a reference to check whether the DDM has been properly implemented

(*) Arunachalam, S. "Peer Review of Source Apportionment Tools in CAMx and CMAQ." *Institute for the Environment, UNC, Prepared for US EPA Contract No. EP-D-07-102* (2009).

Emission Control Scenarios

(i) Scenario A

- 90% NOx reduction from near coal-fired EGUs

(ii) Scenario B

- 100% NOx reduction from near coal-fired EGUs

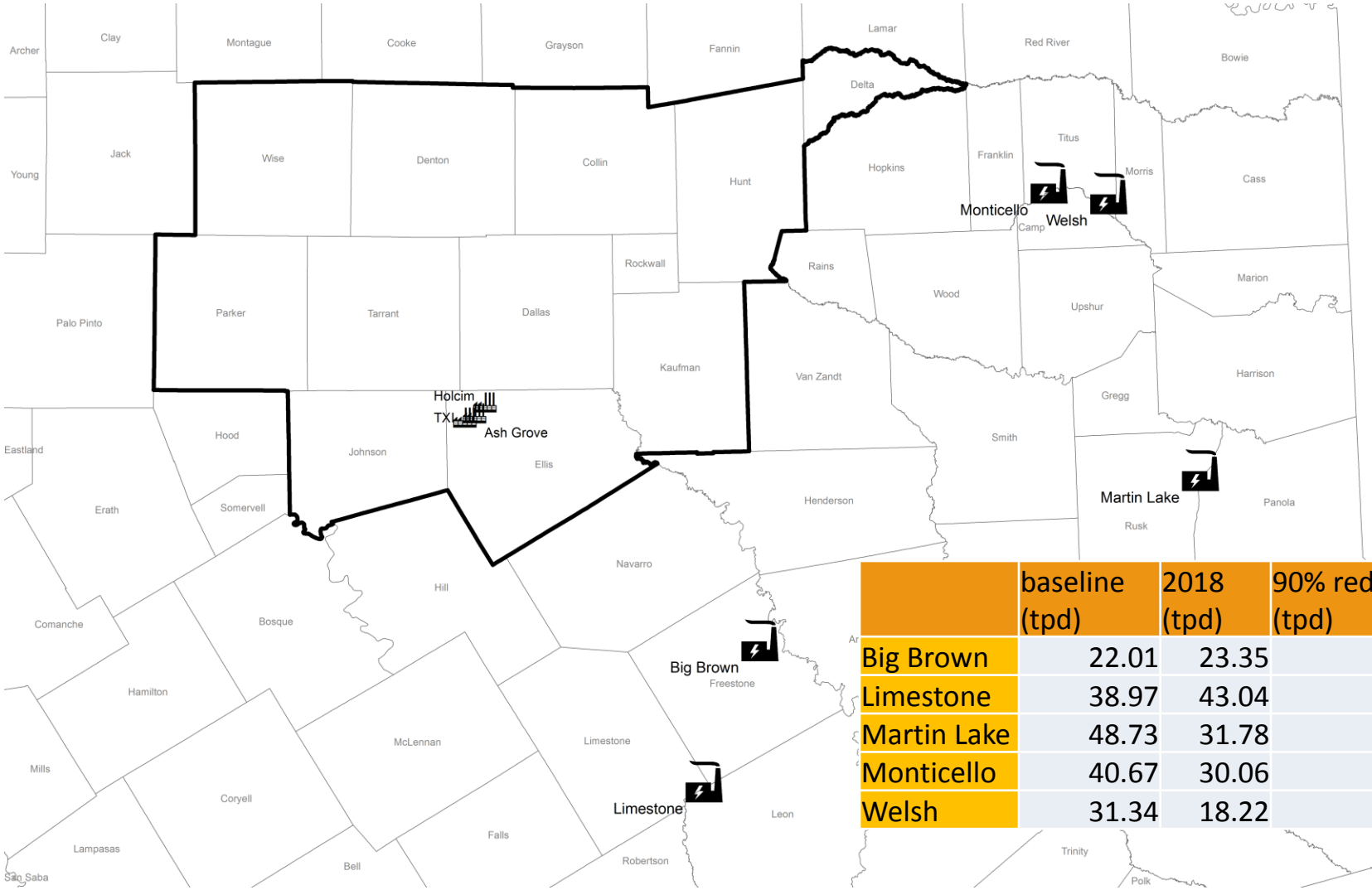
(iii) Scenario C

- 90% NOx reduction from the Midlothian cement kilns

(iv) Scenario D

- 50% NOx reduction from the Barnett Shale point sources

NO_X reduction from major point sources



	baseline (tpd)	2018 (tpd)	90% reduction (tpd)
Big Brown	22.01	23.35	2.20
Limestone	38.97	43.04	3.90
Martin Lake	48.73	31.78	4.87
Monticello	40.67	30.06	4.07
Welsh	31.34	18.22	3.13

Emission Control Scenarios

(v) Scenario E

- 100% NOx reduction from the Barnett Shale point sources

(vi) Scenario F

- 100% NOx and VOC reduction at the Barnett Shale (area and point sources) and Haynesville (area sources)

(vii) Scenario G (*Cumulative Scenario #3*)

- 90% NOx reduction at the coal-fired EGUs
- 90% NOx reduction at the cement kilns
- 50% NOX reduction at Barnett Shale large compressors

Results – Scenario A

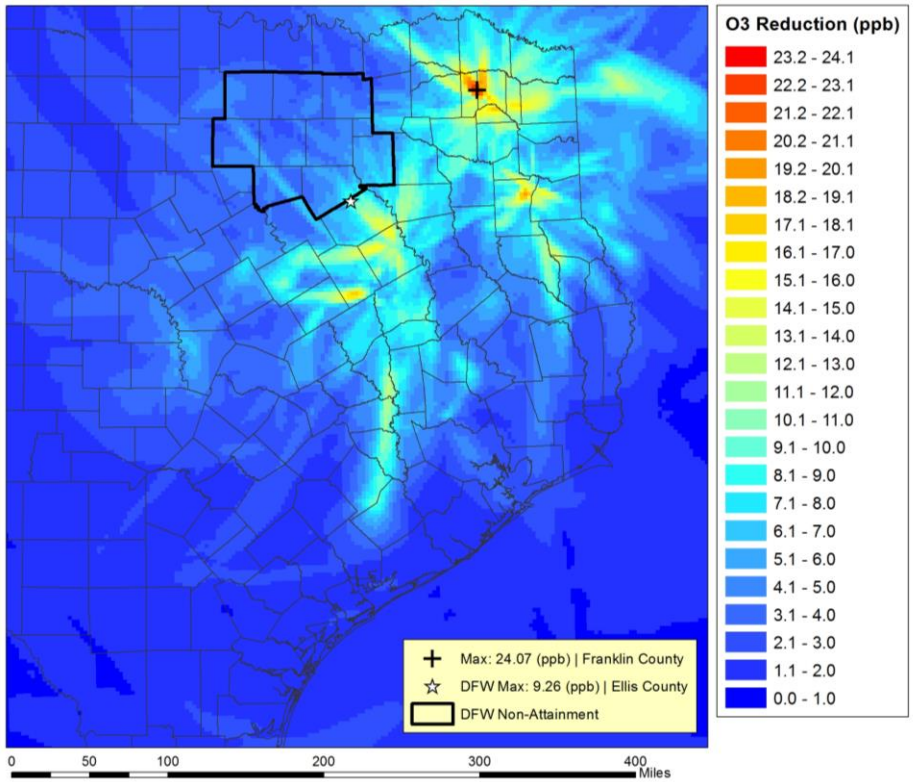
90% NOx reduction from the coal-fired EGUs

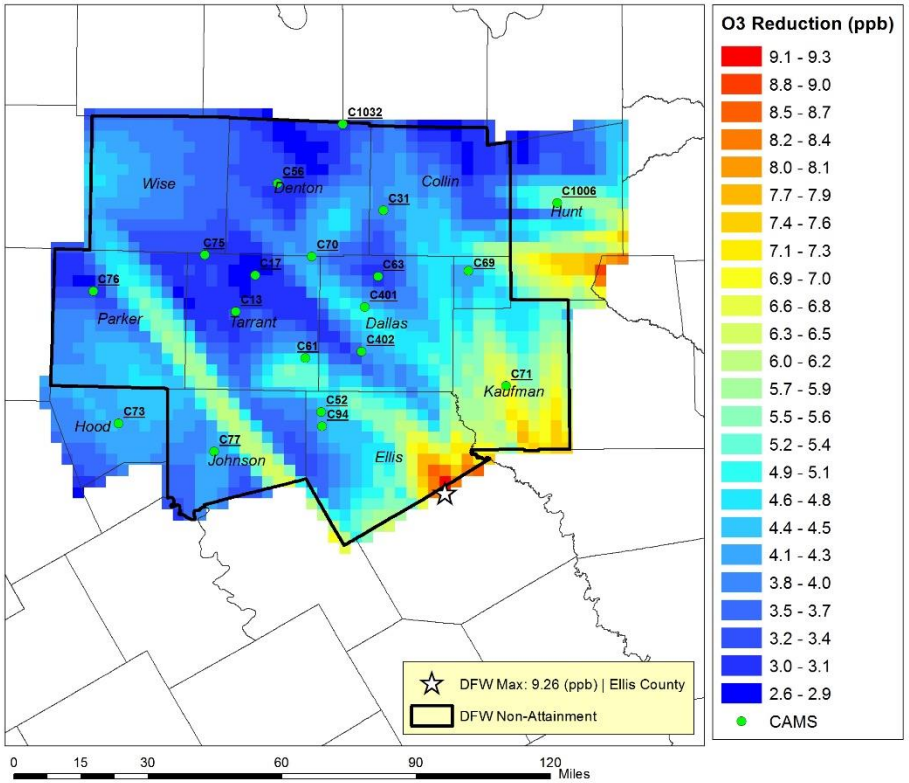
Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells near CAMS (Scenario – FY18)

CAMS	Scenario A
	67-day episode
Kaufman - C71	6.5
Dallas Hinton St. - C401	5.7
Arlington - C61	5.7
Grapevine - C70	5.7
Greenville - C1006	5.5
Dallas Exec. Airport - C402	5.3
Itally/Ellis - C650	5.3
Midlothian OFW - C52	5.3
Rockwall - C69	4.9
Midlothian Tower - C94	4.9
Dallas North - C63	4.7
Denton Airport South - C56	4.6
Keller-C17	4.5
Frisco - C31	4.4
Cleburne Airport - C77	4.4
Granbury - C73	4.1
Pilot Point - C1032	4.0
Ft. Worth Northwest-C13	3.7
Parker County - C76	3.6
Eagle Mt. Lake - C75	3.4

Results – Scenario A

90% NOx reduction from the coal-fired EGUs

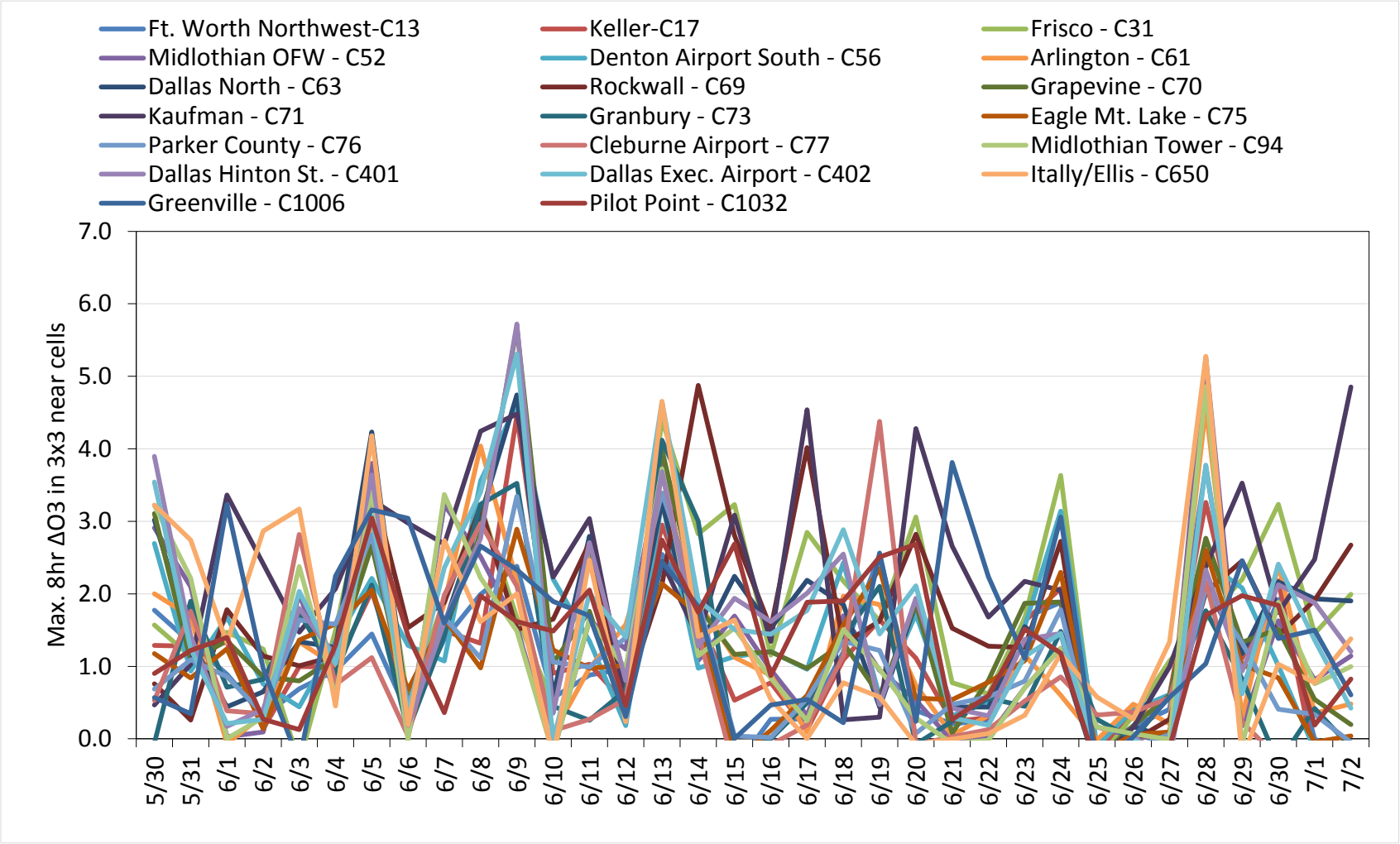




Results – Scenario A

90% NOx reduction from the coal-fired EGUs

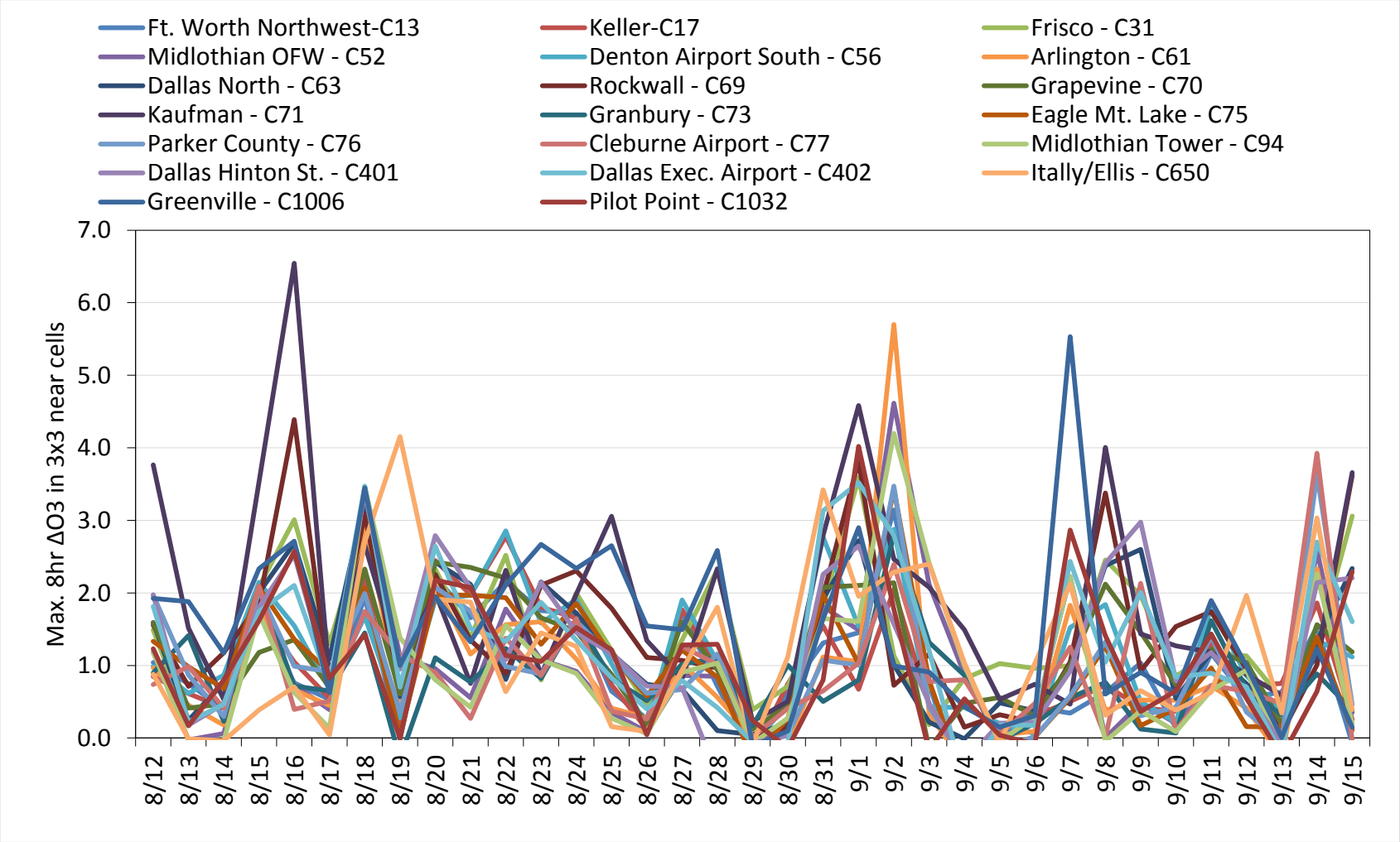
Absolute maximum effect on 3x3 cells near the CAMS



Results – Scenario A

90% NOx reduction from the coal-fired EGUs

Absolute maximum effect on 3x3 cells near the CAMS



Results – Scenario A

90% NOx reduction from the coal-fired EGUs

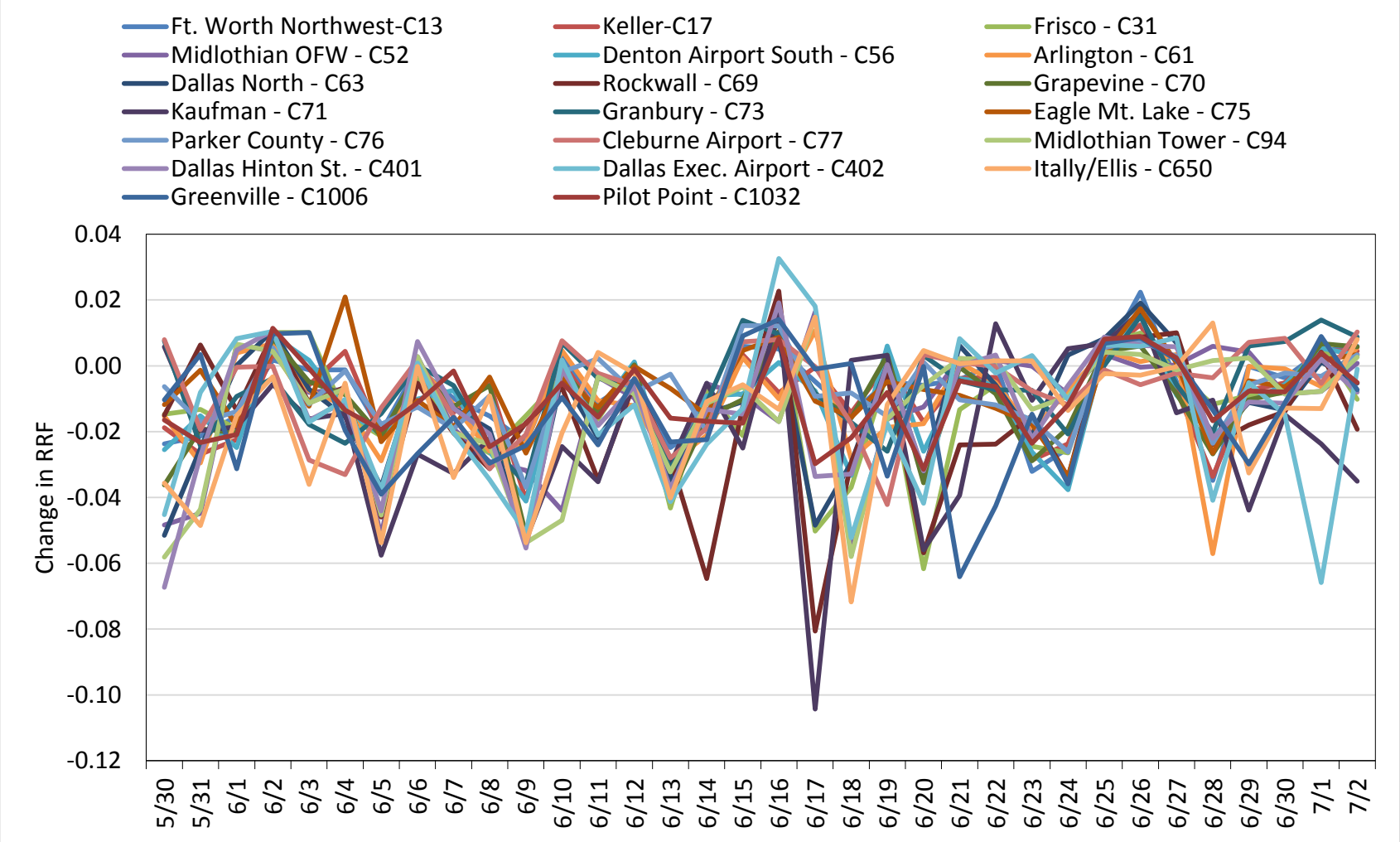
Change in Relative Response Factor (using the 10 highest days) and projected design value

CAMS	2006 DV_B (ppb)	UNT Projection		Scenario A	
		FY18 RRF	FY18 DV_F	Scenario RRF	Scenario DV_F
Ft. Worth Northwest-C13	89.33	0.8209	73.3	0.8080	72.2
Keller-C17	91.00	0.8169	74.3	0.8026	73.0
Frisco - C31	87.67	0.8266	72.5	0.8169	71.6
Midlothian OFW - C52	77.00	0.8255	63.6	0.8146	62.7
Denton Airport South - C56	93.33	0.8127	75.8	0.8012	74.8
Arlington - C61	83.33	0.8260	68.8	0.8130	67.7
Dallas North - C63	85.00	0.8365	71.1	0.8247	70.1
Rockwall - C69	77.67	0.8436	65.5	0.8324	64.7
Grapevine - C70	90.67	0.8196	74.3	0.8052	73.0
Kaufman - C71	74.67	0.8522	63.6	0.8359	62.4
Granbury - C73	83.00	0.8146	67.6	0.8015	66.5
Eagle Mt. Lake - C75	93.33	0.8061	75.2	0.7969	74.4
Parker County - C76	87.67	0.8250	72.3	0.8139	71.4
Cleburne Airport - C77	85.00	0.8187	69.6	0.7980	67.8
Midlothian Tower - C94	80.50	0.8246	66.4	0.8127	65.4
Dallas Hinton St. - C401	81.67	0.8294	67.7	0.8152	66.6
Dallas Exec. Airport - C402	85.00	0.8322	70.7	0.8184	69.6
Greenville - C1006	75.00	0.8335	62.5	0.8265	62.0
Pilot Point - C1032	81.00	0.8140	65.9	0.8050	65.2

Results – Scenario A

90% NOx reduction from the coal-fired EGUs

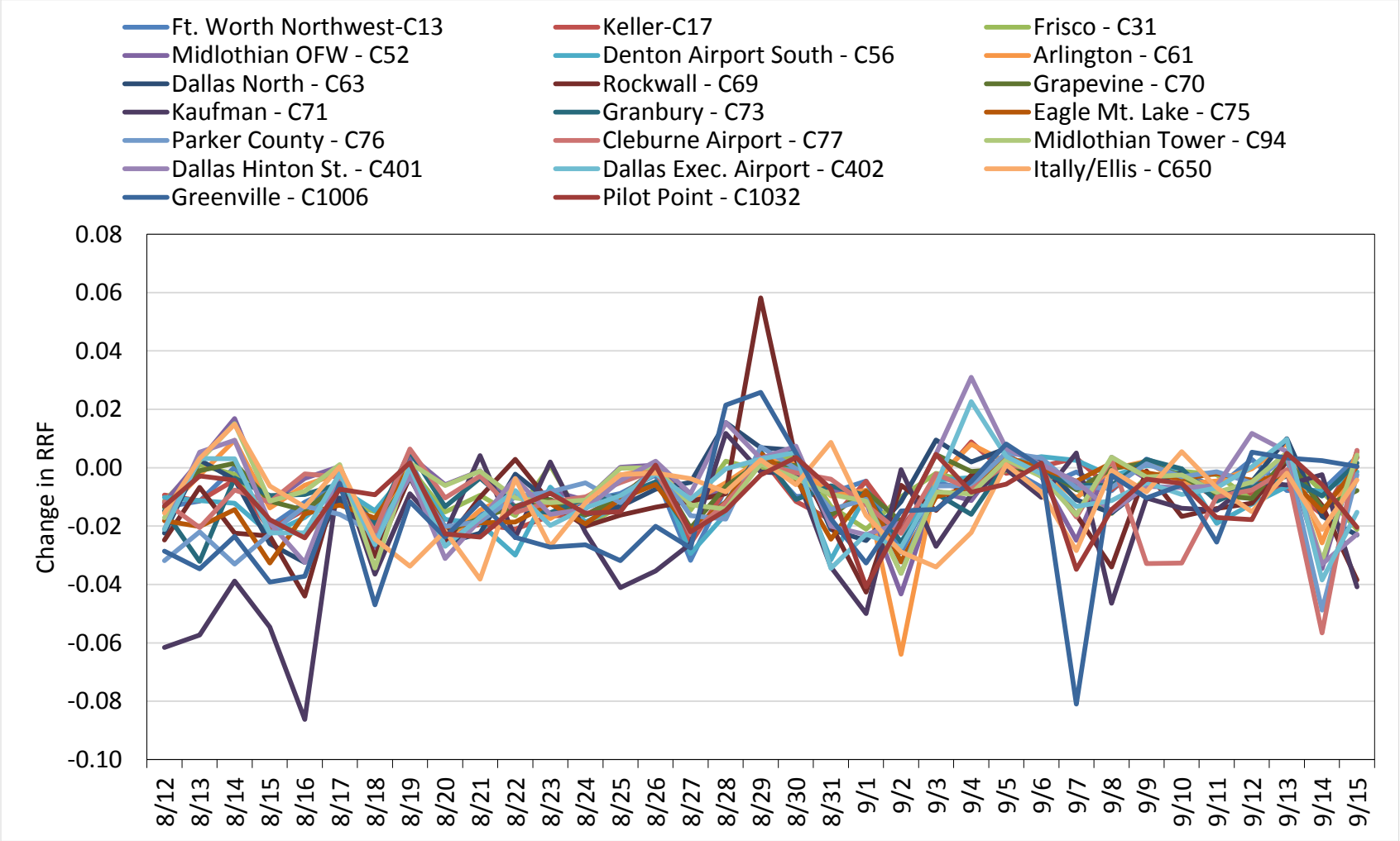
Effect of the scenario on daily RRF



Results – Scenario A

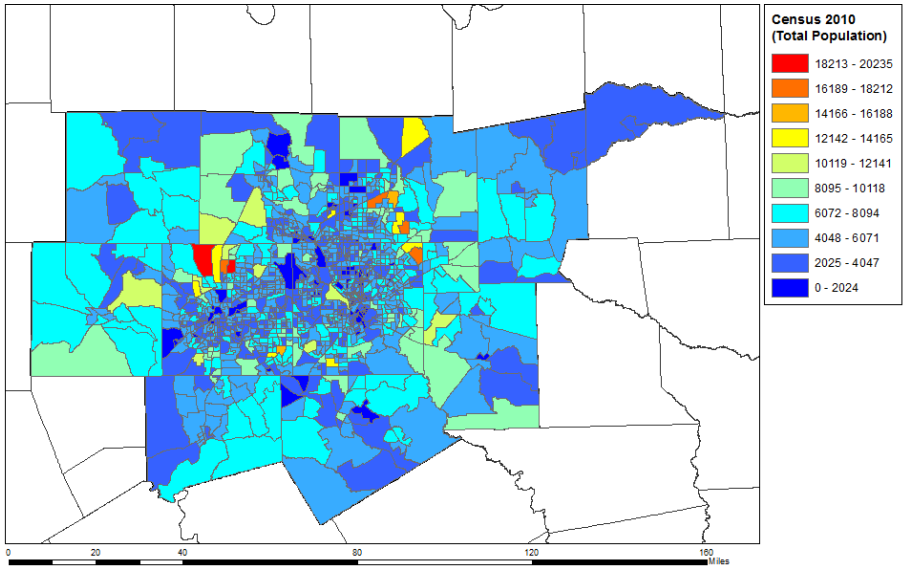
90% NOx reduction from the coal-fired EGUs

Effect of the scenario on daily RRF

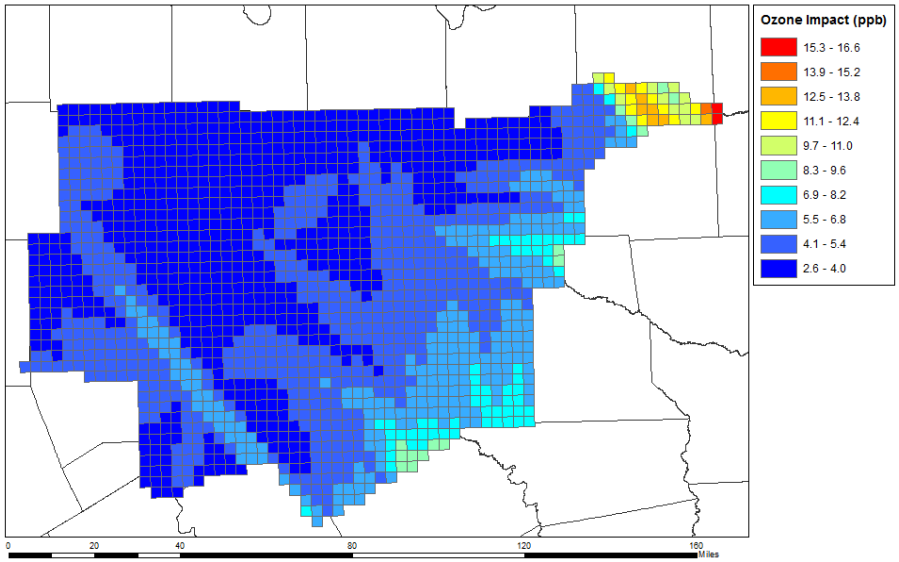


Results – Scenario A

Total population (Census 2010 data)



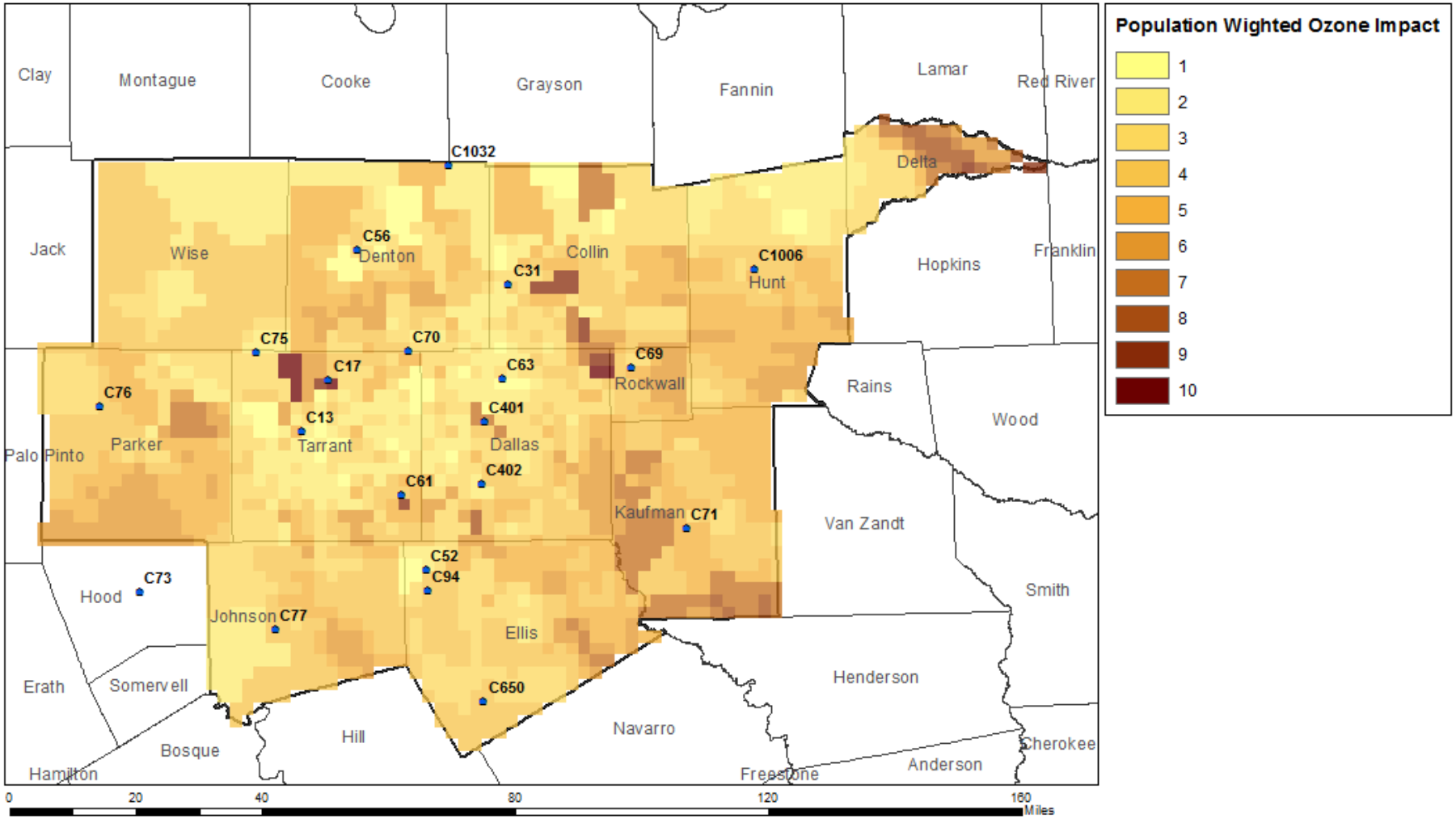
Episodic maximum impact (daily maximum 8h)



0.5 * Scaled population (from 1-10) + 0.5* Scaled ozone impact (from 1-10)

Results – Scenario A

Population weighted ozone impact (50-50%)



Results – Scenario B

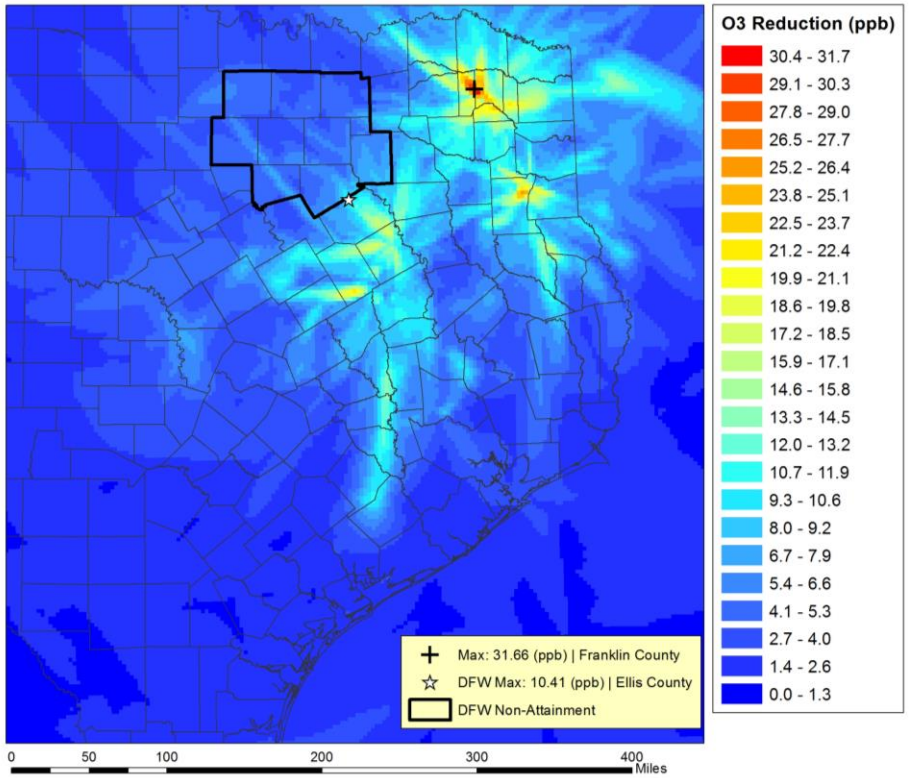
100% NOx reduction from the coal-fired EGUs

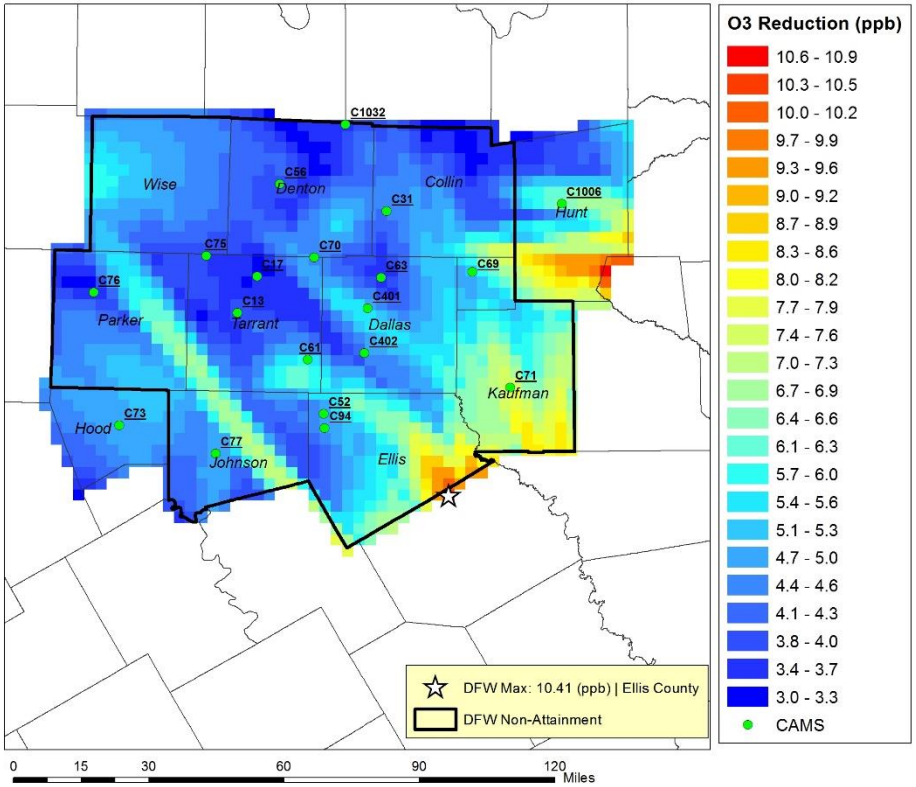
Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells near CAMS (Scenario – FY18)

CAMS	Scenario B
	67-day episode
Kaufman - C71	7.7
Rockwall - C69	6.5
Greenville - C1006	6.5
Itally/Ellis - C650	6.3
Arlington - C61	6.1
Dallas Hinton St. - C401	5.6
Midlothian OFW - C52	5.5
Dallas Exec. Airport - C402	5.3
Midlothian Tower - C94	5.2
Cleburne Airport - C77	4.9
Granbury - C73	4.9
Grapevine - C70	4.8
Frisco - C31	4.6
Dallas North - C63	4.4
Parker County - C76	4.1
Pilot Point - C1032	4.1
Eagle Mt. Lake - C75	4.0
Denton Airport South - C56	3.9
Ft. Worth Northwest-C13	3.8
Keller-C17	3.5

Results – Scenario B

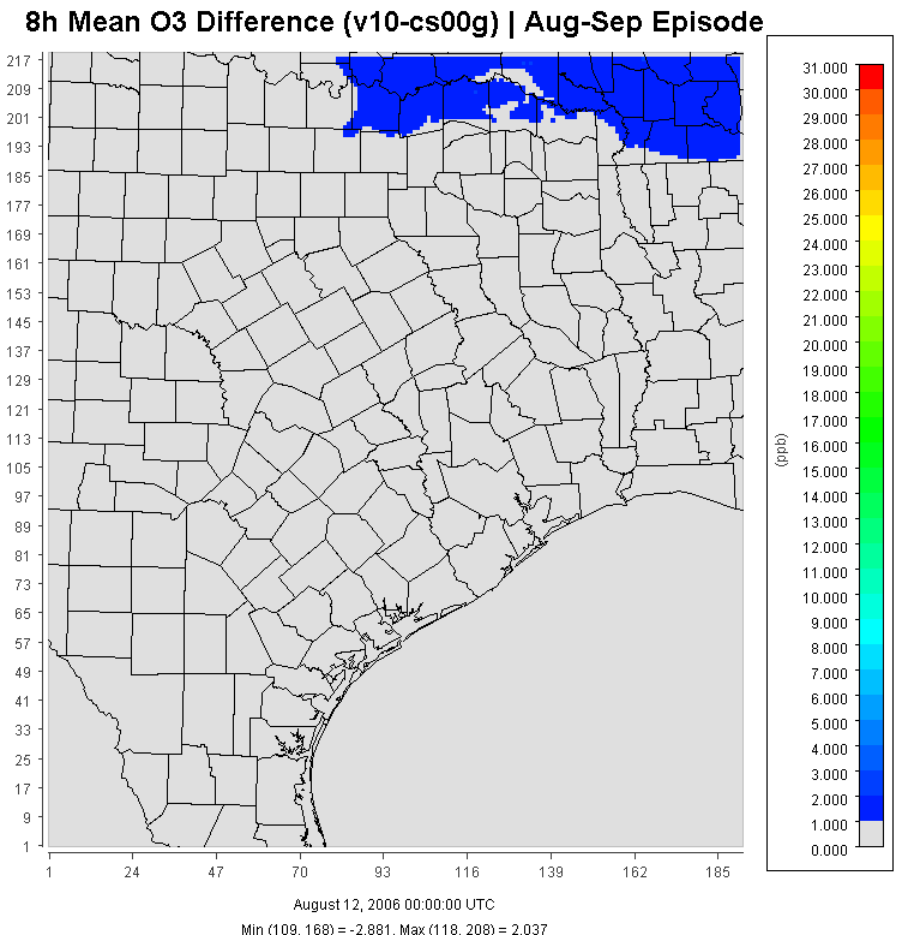
100% NOx reduction from the coal-fired EGUs

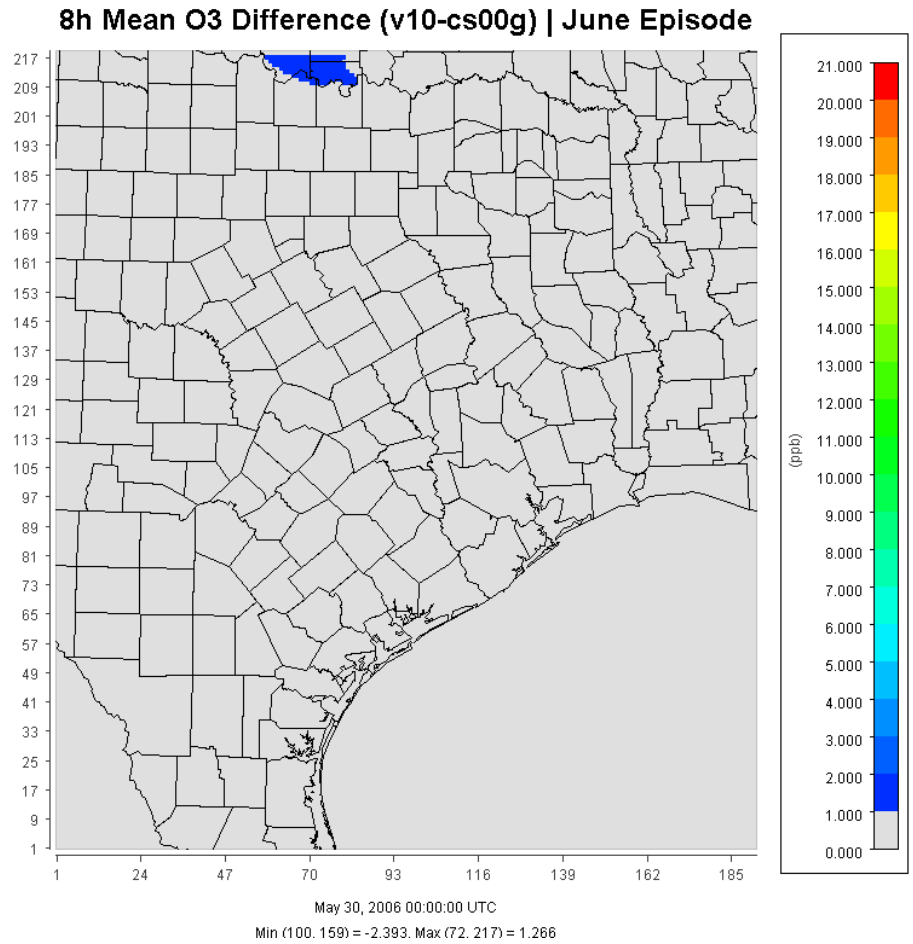




Results – Scenario B

100% NOx reduction from the coal-fired EGUs





Results – Scenario B

100% NOx reduction from the coal-fired EGUs

Change in Relative Response Factor (using the 10 highest days) and projected design value

CAMS	2006 DV_B (ppb)	UNT Projection		Scenario B	
		FY18 RRF	FY18 DV_F	Scenario RRF	Scenario DV_F
Ft. Worth Northwest-C13	89.33	0.8209	73.3	0.8120	72.5
Keller-C17	91.00	0.8169	74.3	0.8072	73.5
Frisco - C31	87.67	0.8266	72.5	0.8177	71.7
Midlothian OFW - C52	77.00	0.8255	63.6	0.8114	62.5
Denton Airport South - C56	93.33	0.8127	75.8	0.8029	74.9
Arlington - C61	83.33	0.8260	68.8	0.8163	68.0
Dallas North - C63	85.00	0.8365	71.1	0.8278	70.4
Rockwall - C69	77.67	0.8436	65.5	0.8327	64.7
Grapevine - C70	90.67	0.8196	74.3	0.8111	73.5
Kaufman - C71	74.67	0.8522	63.6	0.8298	62.0
Granbury - C73	83.00	0.8146	67.6	0.8021	66.6
Eagle Mt. Lake - C75	93.33	0.8061	75.2	0.8002	74.7
Parker County - C76	87.67	0.8250	72.3	0.8180	71.7
Cleburne Airport - C77	85.00	0.8187	69.6	0.7996	68.0
Midlothian Tower - C94	80.50	0.8246	66.4	0.8089	65.1
Dallas Hinton St. - C401	81.67	0.8294	67.7	0.8190	66.9
Dallas Exec. Airport - C402	85.00	0.8322	70.7	0.8223	69.9
Greenville - C1006	75.00	0.8335	62.5	0.8199	61.5
Pilot Point - C1032	81.00	0.8140	65.9	0.8069	65.4

Results – Scenario C

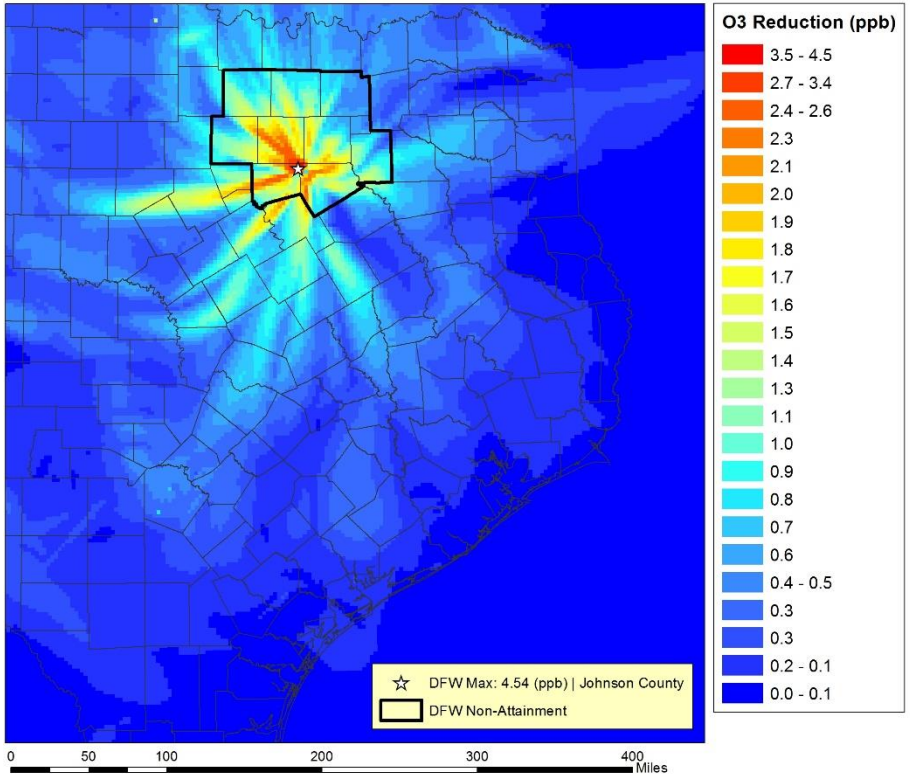
90% NOx reduction from the Midlothian cement kilns

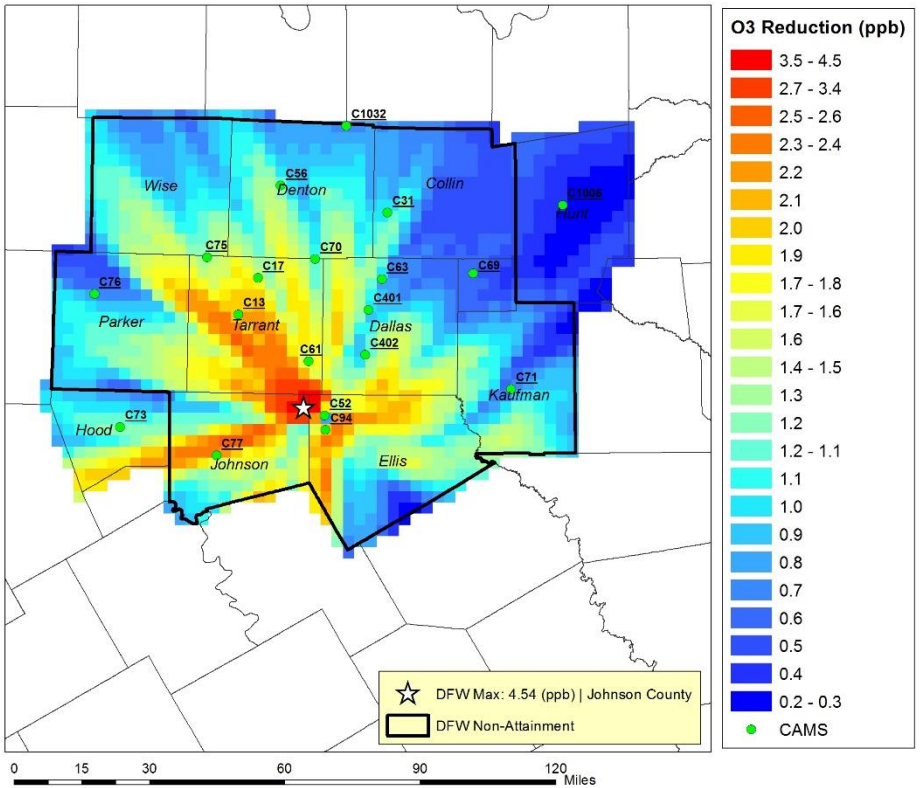
Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells near CAMS (Scenario – FY18)

CAMS	Scenario C 67-day episode
Midlothian OFW - C52	4.5
Cleburne Airport - C77	4.0
Ft. Worth Northwest-C13	3.3
Arlington - C61	3.3
Midlothian Tower - C94	3.2
Dallas Exec. Airport - C402	3.1
Granbury - C73	2.9
Kaufman - C71	2.8
Greenville - C1006	2.7
Dallas Hinton St. - C401	2.5
Dallas North - C63	2.5
Eagle Mt. Lake - C75	2.5
Frisco - C31	2.4
Keller-C17	2.4
Parker County - C76	2.3
Grapevine - C70	2.3
Denton Airport South - C56	2.3
Rockwall - C69	2.1
Itally/Ellis - C650	2.1
Pilot Point - C1032	1.9

Results – Scenario C

90% NOx reduction from the Midlothian cement kilns





Results – Scenario C

90% NOx reduction from the Midlothian cement kilns

Change in Relative Response Factor (using the 10 highest days) and projected design value

CAMS	2006 DV_B (ppb)	UNT Projection		Scenario C	
		FY18 RRF	FY18 DV_F	Scenario RRF	Scenario DV_F
Ft. Worth Northwest-C13	89.33	0.8209	73.3	0.8109	72.4
Keller-C17	91.00	0.8169	74.3	0.8090	73.6
Frisco - C31	87.67	0.8266	72.5	0.8225	72.1
Midlothian OFW - C52	77.00	0.8255	63.6	0.8203	63.2
Denton Airport South - C56	93.33	0.8127	75.8	0.8083	75.4
Arlington - C61	83.33	0.8260	68.8	0.8168	68.1
Dallas North - C63	85.00	0.8365	71.1	0.8308	70.6
Rockwall - C69	77.67	0.8436	65.5	0.8410	65.3
Grapevine - C70	90.67	0.8196	74.3	0.8111	73.5
Kaufman - C71	74.67	0.8522	63.6	0.8567	64.0
Granbury - C73	83.00	0.8146	67.6	0.8100	67.2
Eagle Mt. Lake - C75	93.33	0.8061	75.2	0.7977	74.5
Parker County - C76	87.67	0.8250	72.3	0.8166	71.6
Cleburne Airport - C77	85.00	0.8187	69.6	0.8118	69.0
Midlothian Tower - C94	80.50	0.8246	66.4	0.8200	66.0
Dallas Hinton St. - C401	81.67	0.8294	67.7	0.8248	67.4
Dallas Exec. Airport - C402	85.00	0.8322	70.7	0.8277	70.4
Greenville - C1006	75.00	0.8335	62.5	0.8397	63.0
Pilot Point - C1032	81.00	0.8140	65.9	0.8096	65.6

Results – Scenario D

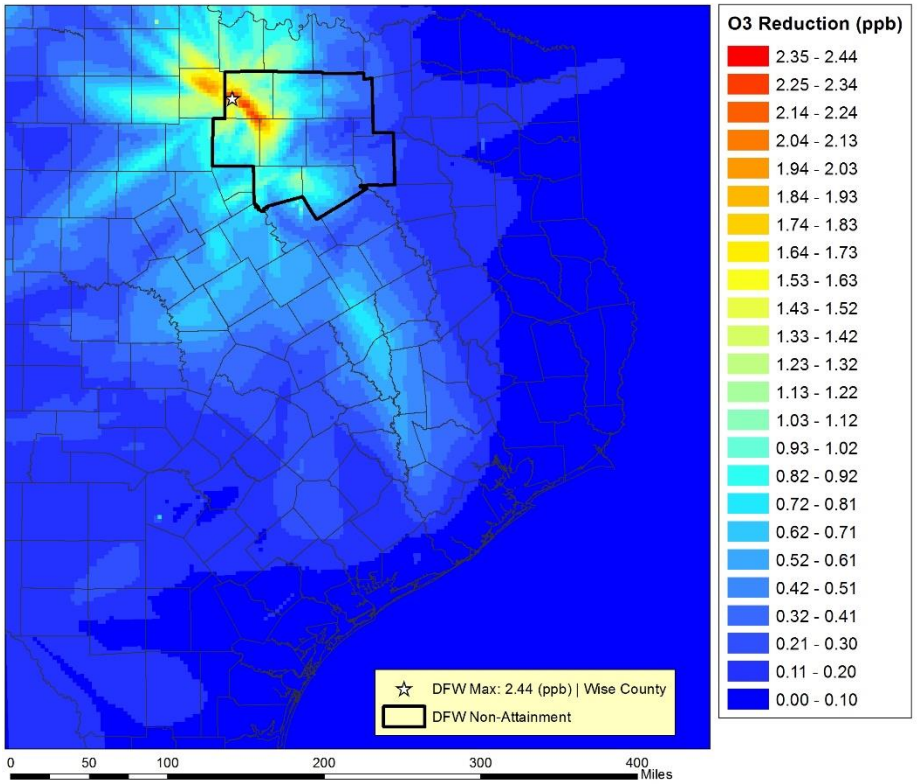
50% NOx reduction from the Barnett Shale point sources

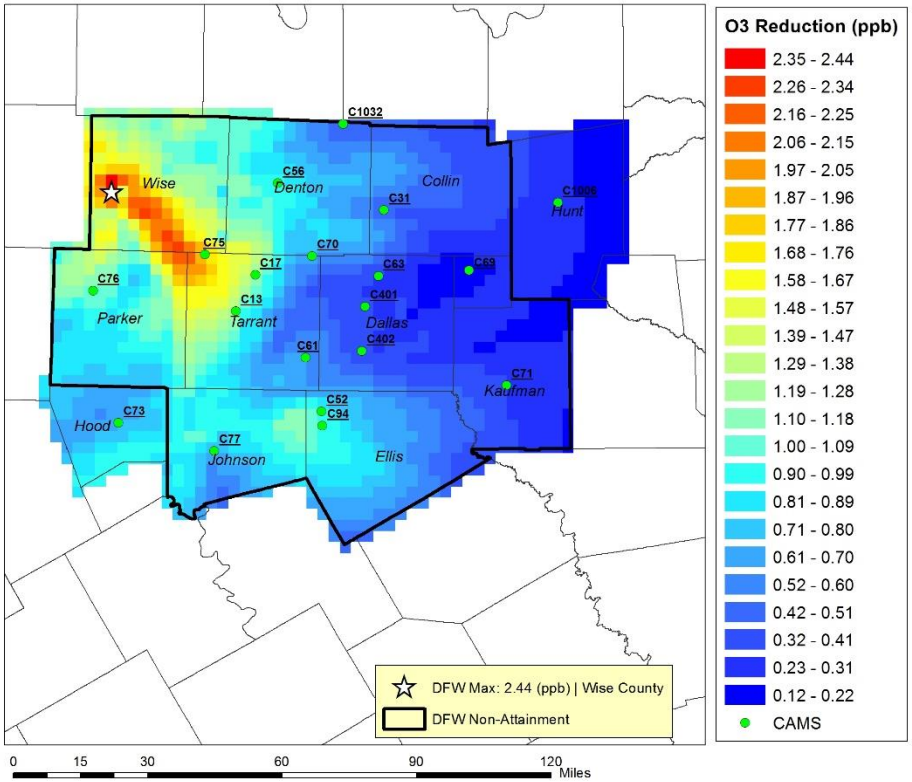
Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells near CAMS (Scenario – FY18)

CAMS	Scenario D 67-day episode
Eagle Mt. Lake - C75	2.2
Keller-C17	1.5
Ft. Worth Northwest-C13	1.5
Parker County - C76	1.2
Midlothian OFW - C52	1.1
Midlothian Tower - C94	1.1
Cleburne Airport - C77	1.1
Denton Airport South - C56	1.0
Granbury - C73	0.8
Itally/Ellis - C650	0.8
Grapevine - C70	0.7
Arlington - C61	0.7
Frisco - C31	0.6
Pilot Point - C1032	0.5
Dallas Exec. Airport - C402	0.4
Dallas North - C63	0.4
Kaufman - C71	0.3
Dallas Hinton St. - C401	0.3
Greenville - C1006	0.3
Rockwall - C69	0.2

Results – Scenario D

50% NOx reduction from the Barnett Shale point sources





Results – Scenario D

50% NOx reduction from the Barnett Shale point sources

Change in Relative Response Factor (using the 10 highest days) and projected design value

CAMS	2006 DV_B (ppb)	UNT Projection		Scenario D	
		FY18 RRF	FY18 DV_F	Scenario RRF	Scenario DV_F
Ft. Worth Northwest-C13	89.33	0.8209	73.3	0.8189	73.2
Keller-C17	91.00	0.8169	74.3	0.8159	74.2
Frisco - C31	87.67	0.8266	72.5	0.8261	72.4
Midlothian OFW - C52	77.00	0.8255	63.6	0.8244	63.5
Denton Airport South - C56	93.33	0.8127	75.8	0.8114	75.7
Arlington - C61	83.33	0.8260	68.8	0.8246	68.7
Dallas North - C63	85.00	0.8365	71.1	0.8360	71.1
Rockwall - C69	77.67	0.8436	65.5	0.8432	65.5
Grapevine - C70	90.67	0.8196	74.3	0.8185	74.2
Kaufman - C71	74.67	0.8522	63.6	0.8516	63.6
Granbury - C73	83.00	0.8146	67.6	0.8109	67.3
Eagle Mt. Lake - C75	93.33	0.8061	75.2	0.8054	75.2
Parker County - C76	87.67	0.8250	72.3	0.8230	72.2
Cleburne Airport - C77	85.00	0.8187	69.6	0.8163	69.4
Midlothian Tower - C94	80.50	0.8246	66.4	0.8237	66.3
Dallas Hinton St. - C401	81.67	0.8294	67.7	0.8289	67.7
Dallas Exec. Airport - C402	85.00	0.8322	70.7	0.8313	70.7
Greenville - C1006	75.00	0.8335	62.5	0.8332	62.5
Pilot Point - C1032	81.00	0.8140	65.9	0.8129	65.8

Results – Scenario E

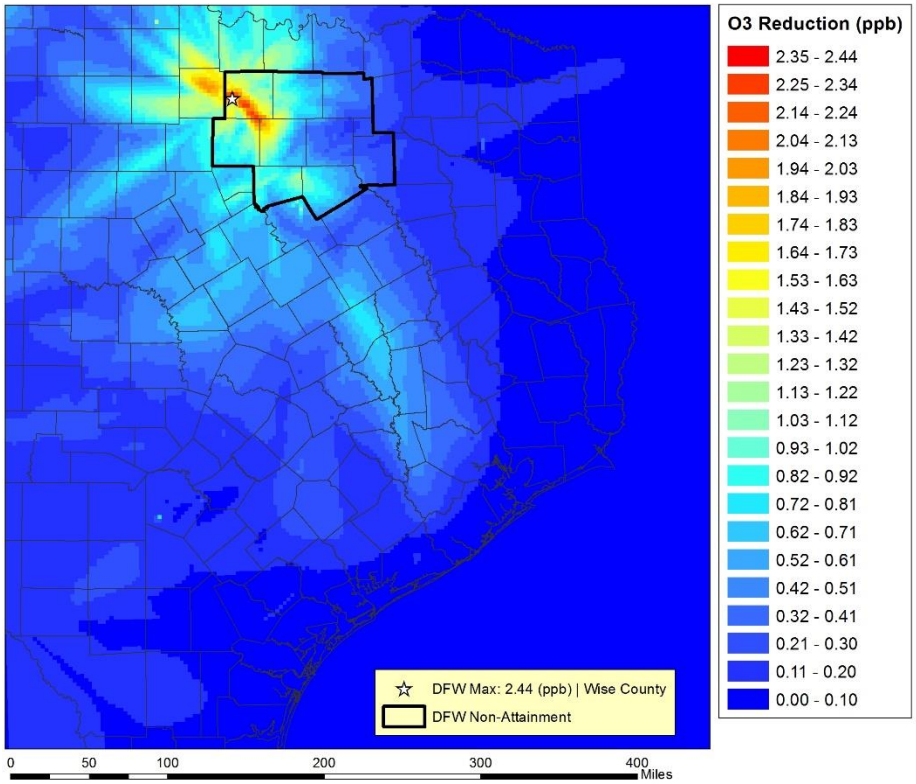
100% NOx reduction from the Barnett Shale point sources

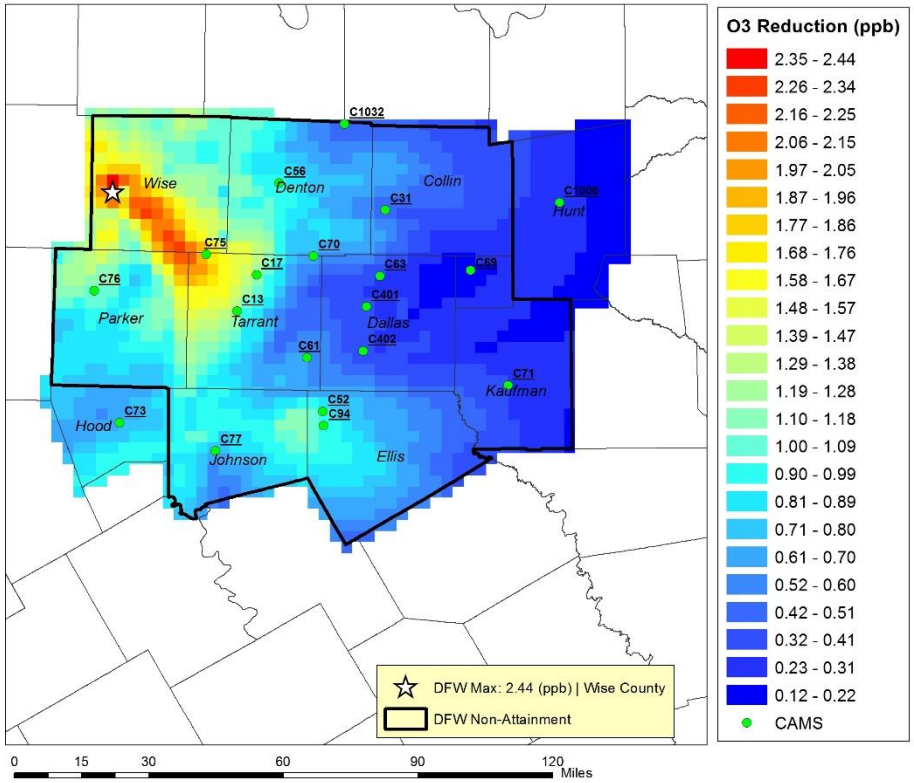
Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells near CAMS (Scenario – FY18)

CAMS	Scenario E
	67-day episode
Eagle Mt. Lake - C75	3.3
Keller-C17	2.2
Ft. Worth Northwest-C13	2.2
Parker County - C76	1.8
Denton Airport South - C56	1.4
Midlothian OFW - C52	1.4
Midlothian Tower - C94	1.4
Cleburne Airport - C77	1.3
Granbury - C73	1.0
Grapevine - C70	1.0
Itally/Ellis - C650	1.0
Frisco - C31	0.8
Arlington - C61	0.8
Pilot Point - C1032	0.7
Dallas North - C63	0.6
Dallas Exec. Airport - C402	0.5
Dallas Hinton St. - C401	0.4
Kaufman - C71	0.4
Greenville - C1006	0.4
Rockwall - C69	0.3

Results – Scenario E

100% NOx reduction from the Barnett Shale point sources





Results – Scenario E

100% NOx reduction from the Barnett Shale point sources

Change in Relative Response Factor (using the 10 highest days) and projected design value

CAMS	2006 DV_B (ppb)	UNT Projection		Scenario E	
		FY18 RRF	FY18 DV_F	Scenario RRF	Scenario DV_F
Ft. Worth Northwest-C13	89.33	0.8209	73.3	0.8185	73.1
Keller-C17	91.00	0.8169	74.3	0.8157	74.2
Frisco - C31	87.67	0.8266	72.5	0.8260	72.4
Midlothian OFW - C52	77.00	0.8255	63.6	0.8242	63.5
Denton Airport South - C56	93.33	0.8127	75.8	0.8112	75.7
Arlington - C61	83.33	0.8260	68.8	0.8242	68.7
Dallas North - C63	85.00	0.8365	71.1	0.8359	71.1
Rockwall - C69	77.67	0.8436	65.5	0.8431	65.5
Grapevine - C70	90.67	0.8196	74.3	0.8182	74.2
Kaufman - C71	74.67	0.8522	63.6	0.8515	63.6
Granbury - C73	83.00	0.8146	67.6	0.8100	67.2
Eagle Mt. Lake - C75	93.33	0.8061	75.2	0.8054	75.2
Parker County - C76	87.67	0.8250	72.3	0.8226	72.1
Cleburne Airport - C77	85.00	0.8187	69.6	0.8157	69.3
Midlothian Tower - C94	80.50	0.8246	66.4	0.8236	66.3
Dallas Hinton St. - C401	81.67	0.8294	67.7	0.8287	67.7
Dallas Exec. Airport - C402	85.00	0.8322	70.7	0.8311	70.6
Greenville - C1006	75.00	0.8335	62.5	0.8331	62.5
Pilot Point - C1032	81.00	0.8140	65.9	0.8126	65.8

Results – Scenario F

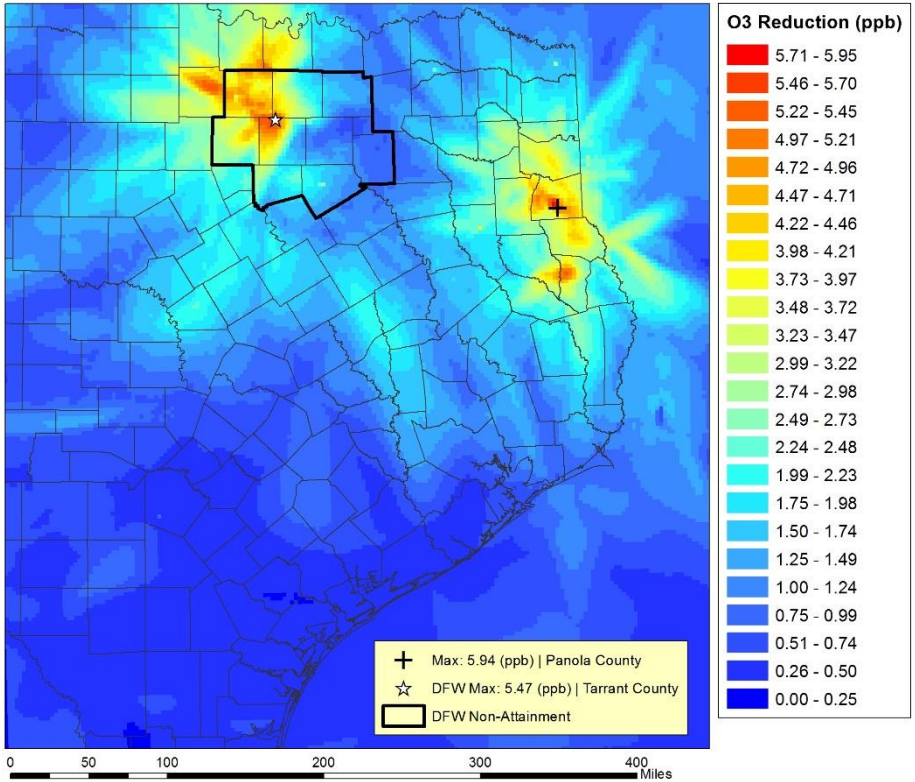
100% NOx and VOC reduction at the Barnett Shale (area and point sources) and Haynesville (area sources)

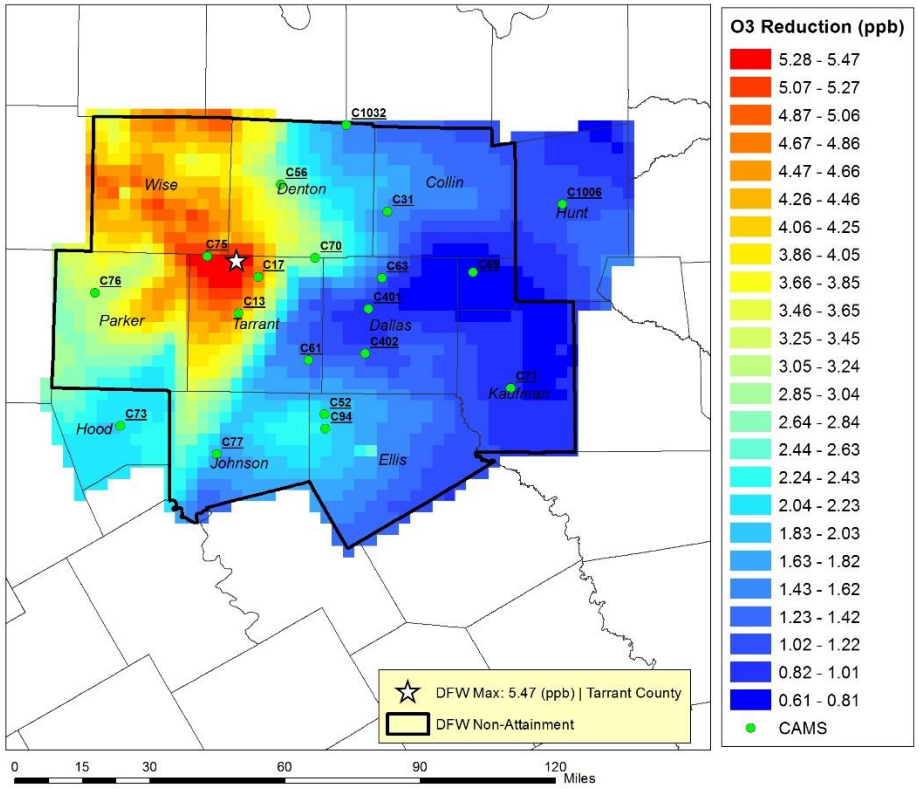
Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells near CAMS (Scenario – FY18)

CAMS	Scenario F
	67-day episode
Eagle Mt. Lake - C75	5.4
Keller-C17	5.3
Ft. Worth Northwest-C13	4.9
Denton Airport South - C56	3.6
Parker County - C76	3.3
Grapevine - C70	3.2
Cleburne Airport - C77	2.3
Granbury - C73	2.2
Midlothian OFW - C52	2.2
Midlothian Tower - C94	2.2
Frisco - C31	1.8
Pilot Point - C1032	1.7
Itally/Ellis - C650	1.6
Arlington - C61	1.6
Dallas North - C63	1.6
Dallas Exec. Airport - C402	1.2
Dallas Hinton St. - C401	1.2
Greenville - C1006	1.2
Kaufman - C71	0.9
Rockwall - C69	0.8

Results – Scenario F

100% NOx and VOC reduction at the Barnett Shale (area and point sources) and Haynesville (area sources)





Results – Scenario F

100% NOx and VOC reduction at the Barnett Shale (area and point sources) and Haynesville (area sources)

Change in Relative Response Factor (using the 10 highest days) and projected design value

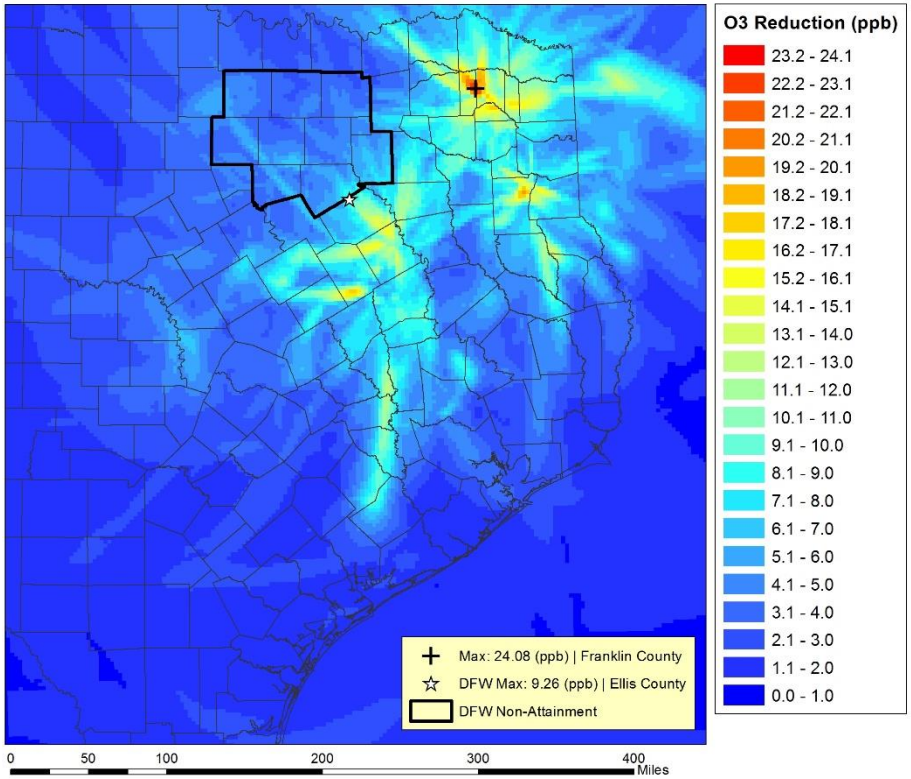
CAMS	2006 DV_B (ppb)	UNT Projection		Scenario F	
		FY18 RRF	FY18 DV_F	Scenario RRF	Scenario DV_F
Ft. Worth Northwest-C13	89.33	0.8209	73.3	0.8137	72.7
Keller-C17	91.00	0.8169	74.3	0.8124	73.9
Frisco - C31	87.67	0.8266	72.5	0.8243	72.3
Midlothian OFW - C52	77.00	0.8255	63.6	0.8223	63.3
Denton Airport South - C56	93.33	0.8127	75.8	0.8081	75.4
Arlington - C61	83.33	0.8260	68.8	0.8203	68.4
Dallas North - C63	85.00	0.8365	71.1	0.8337	70.9
Rockwall - C69	77.67	0.8436	65.5	0.8420	65.4
Grapevine - C70	90.67	0.8196	74.3	0.8153	73.9
Kaufman - C71	74.67	0.8522	63.6	0.8492	63.4
Granbury - C73	83.00	0.8146	67.6	0.8038	66.7
Eagle Mt. Lake - C75	93.33	0.8061	75.2	0.8047	75.1
Parker County - C76	87.67	0.8250	72.3	0.8184	71.8
Cleburne Airport - C77	85.00	0.8187	69.6	0.8118	69.0
Midlothian Tower - C94	80.50	0.8246	66.4	0.8214	66.1
Dallas Hinton St. - C401	81.67	0.8294	67.7	0.8267	67.5
Dallas Exec. Airport - C402	85.00	0.8322	70.7	0.8293	70.5
Greenville - C1006	75.00	0.8335	62.5	0.8303	62.3
Pilot Point - C1032	81.00	0.8140	65.9	0.8104	65.6

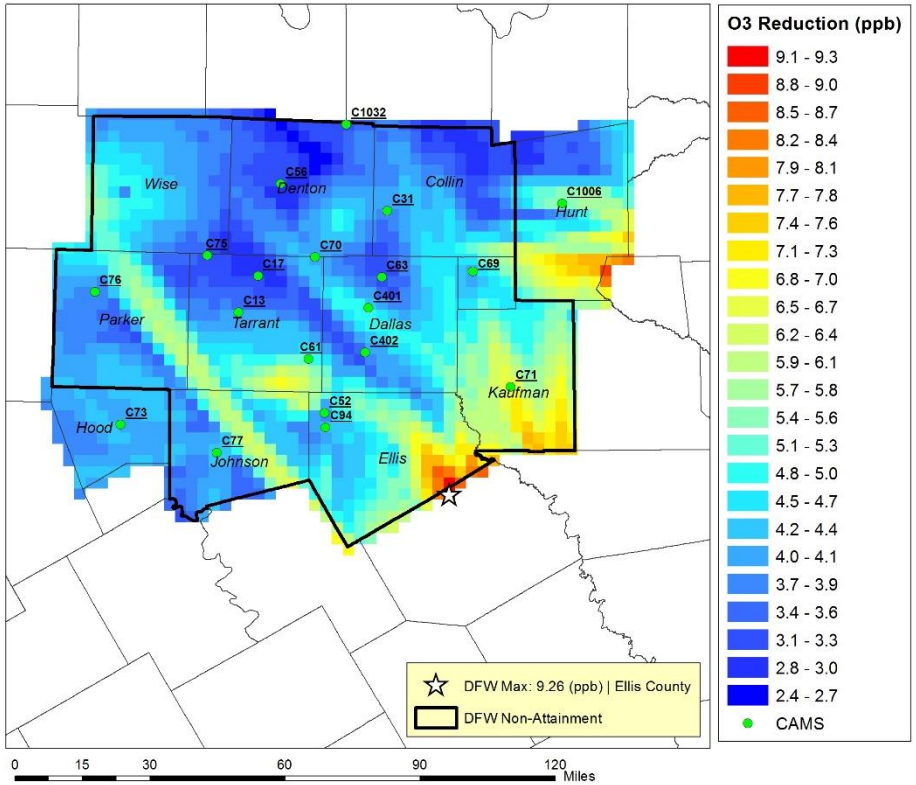
Results – Scenario G (Cumulative Scenario #3)

Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells near CAMS (Scenario – FY18)

CAMS	Scenario G (Cumulative Scenario #3) 67-day episode
Kaufman - C71	6.8
Arlington - C61	6.1
Midlothian OFW - C52	5.6
Greenville - C1006	5.5
Itally/Ellis - C650	5.5
Rockwall - C69	5.1
Dallas Hinton St. - C401	5.0
Dallas Exec. Airport - C402	4.7
Midlothian Tower - C94	4.6
Cleburne Airport - C77	4.3
Grapevine - C70	4.3
Granbury - C73	4.3
Frisco - C31	4.1
Ft. Worth Northwest-C13	4.0
Dallas North - C63	4.0
Parker County - C76	3.8
Pilot Point - C1032	3.6
Denton Airport South - C56	3.3
Eagle Mt. Lake - C75	3.3
Keller-C17	3.1

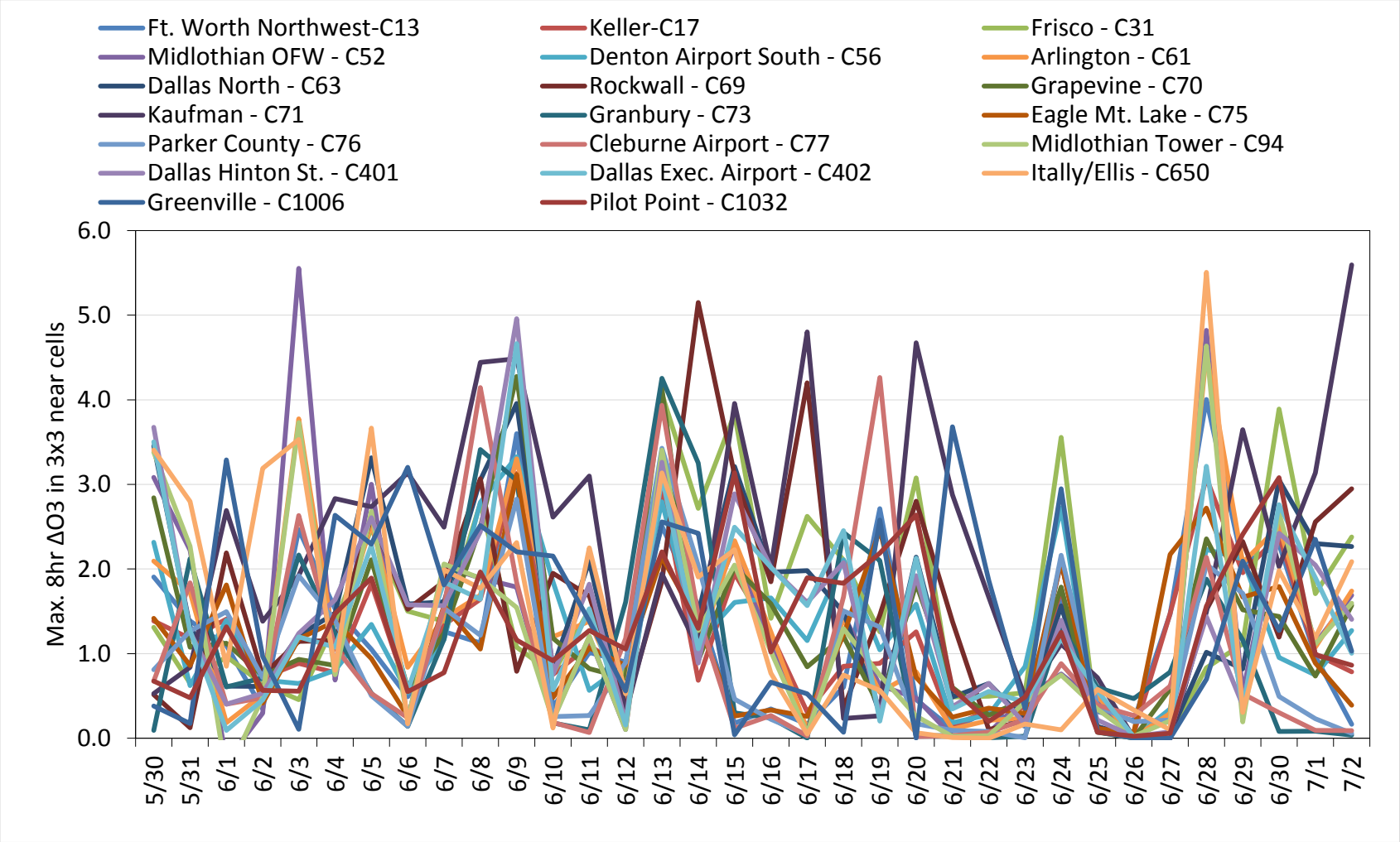
Results – Scenario G (Cumulative Scenario #3)





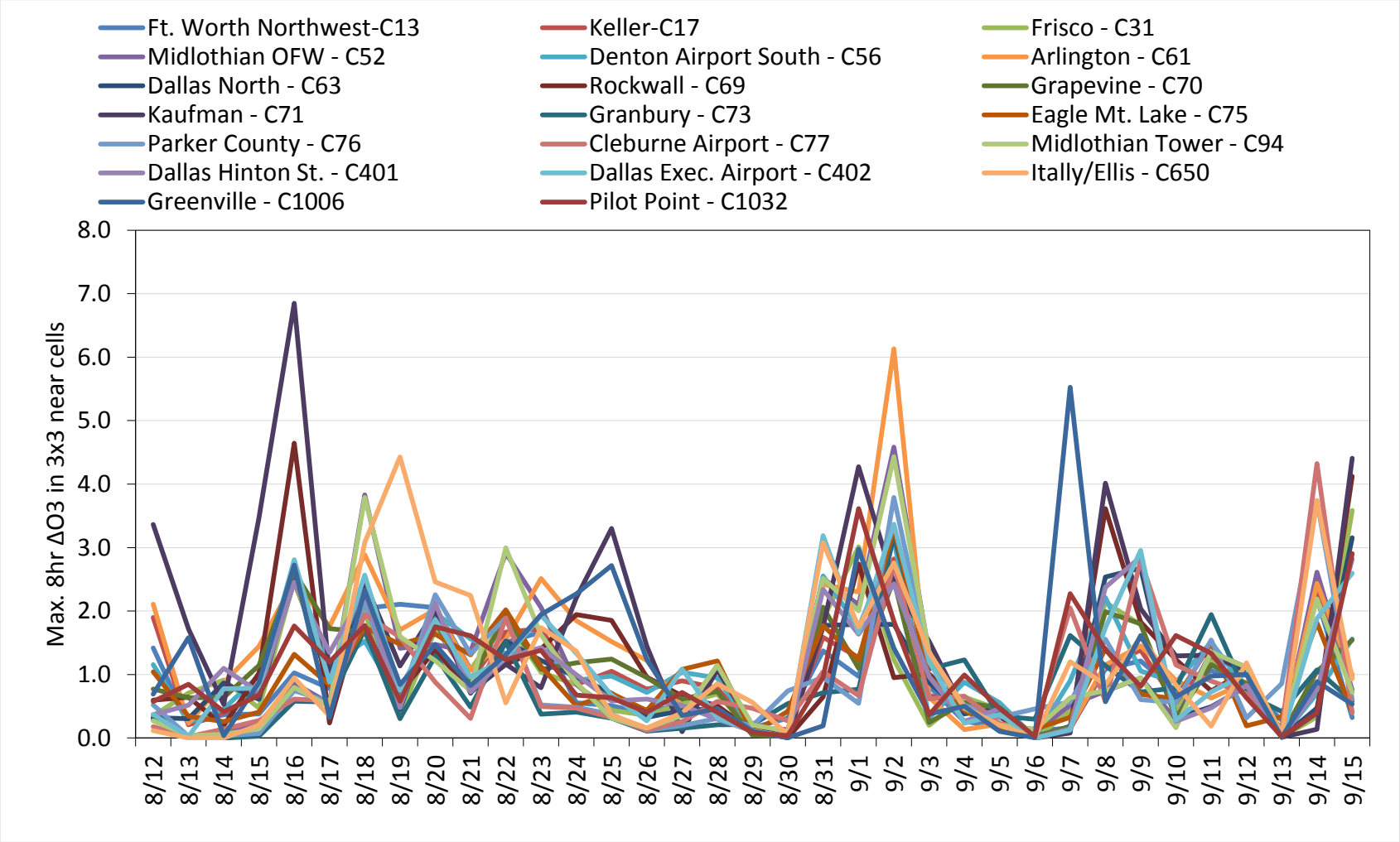
Results – Scenario G (Cumulative Scenario #3)

Absolute maximum effect on 3x3 cells near the CAMS



Results – Scenario G (Cumulative Scenario #3)

Absolute maximum effect on 3x3 cells near the CAMS



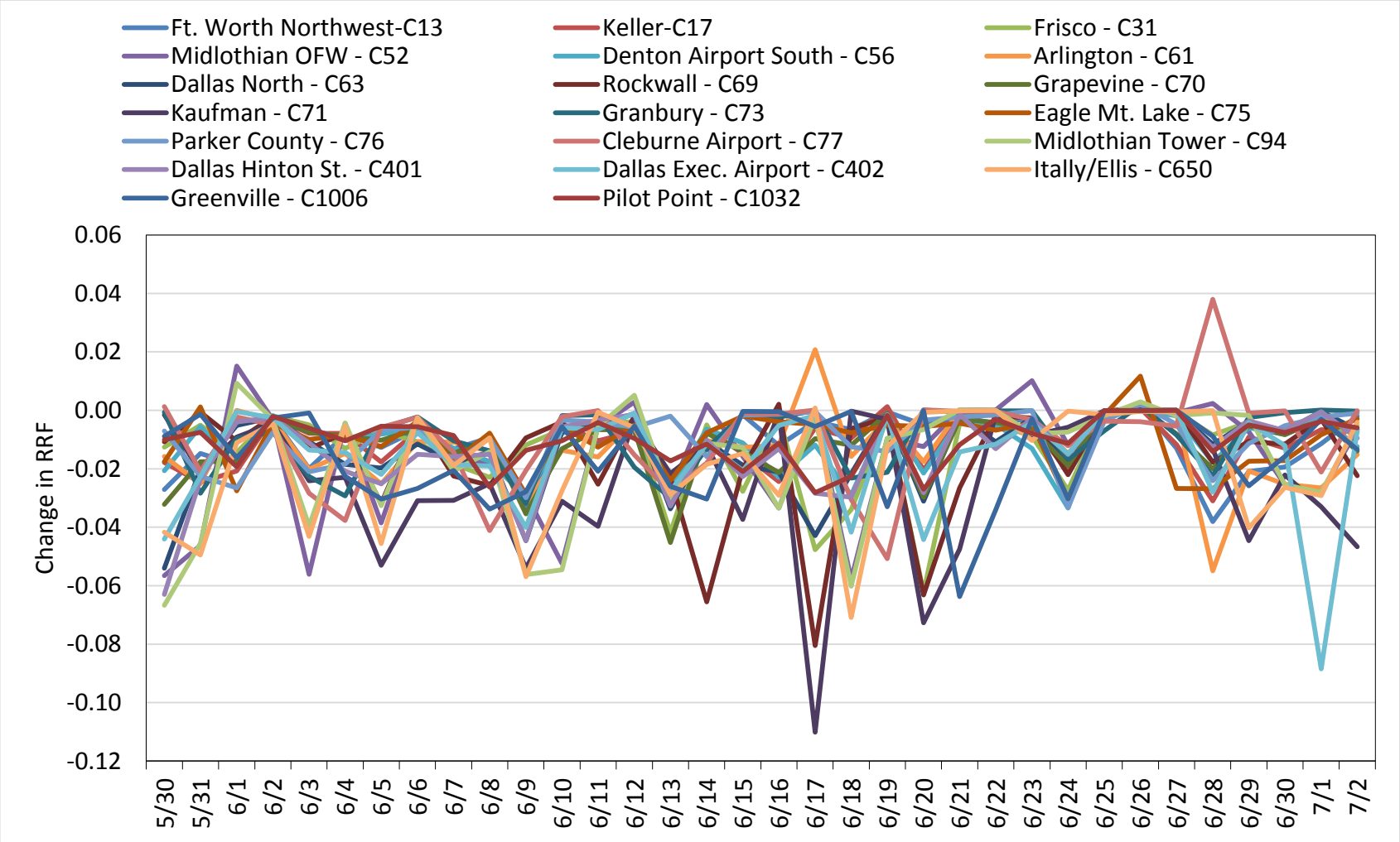
Results – Scenario G (Cumulative Scenario #3)

Change in Relative Response Factor (using the 10 highest days) and projected design value

CAMS	2006 DV_B (ppb)	UNT Projection		Scenario G	
		FY18 RRF	FY18 DV_F	Scenario RRF	Scenario DV_F
Ft. Worth Northwest-C13	89.33	0.8209	73.3	0.8067	72.1
Keller-C17	91.00	0.8169	74.3	0.8050	73.3
Frisco - C31	87.67	0.8266	72.5	0.8159	71.5
Midlothian OFW - C52	77.00	0.8255	63.6	0.8038	61.9
Denton Airport South - C56	93.33	0.8127	75.8	0.8009	74.8
Arlington - C61	83.33	0.8260	68.8	0.8114	67.6
Dallas North - C63	85.00	0.8365	71.1	0.8268	70.3
Rockwall - C69	77.67	0.8436	65.5	0.8320	64.6
Grapevine - C70	90.67	0.8196	74.3	0.8086	73.3
Kaufman - C71	74.67	0.8522	63.6	0.8297	62.0
Granbury - C73	83.00	0.8146	67.6	0.7971	66.2
Eagle Mt. Lake - C75	93.33	0.8061	75.2	0.7960	74.3
Parker County - C76	87.67	0.8250	72.3	0.8136	71.3
Cleburne Airport - C77	85.00	0.8187	69.6	0.7938	67.5
Midlothian Tower - C94	80.50	0.8246	66.4	0.8031	64.7
Dallas Hinton St. - C401	81.67	0.8294	67.7	0.8173	66.7
Dallas Exec. Airport - C402	85.00	0.8322	70.7	0.8207	69.8
Greenville - C1006	75.00	0.8335	62.5	0.8204	61.5
Pilot Point - C1032	81.00	0.8140	65.9	0.8038	65.1

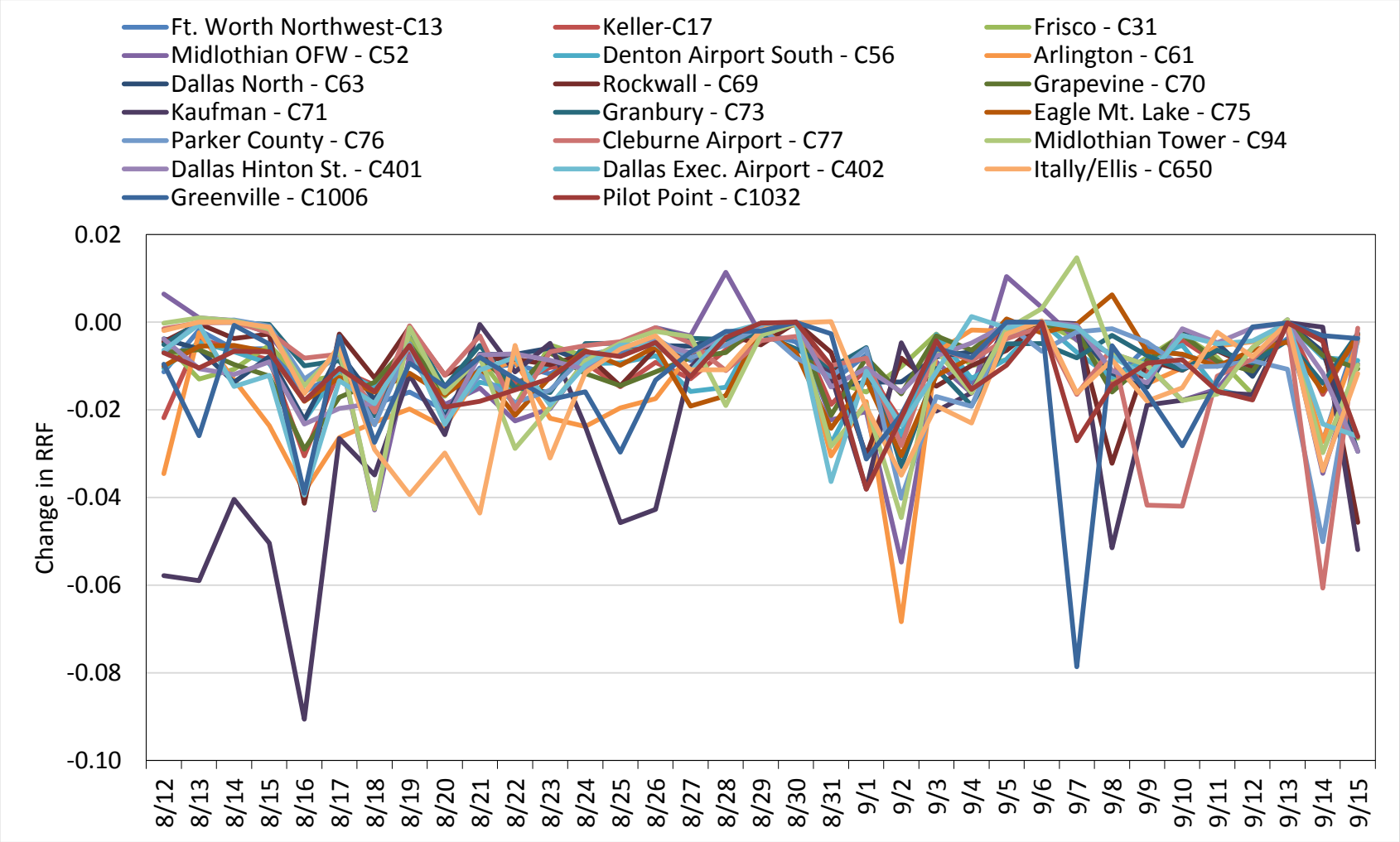
Results – Scenario G (Cumulative Scenario #3)

Effect of the scenario on daily RRF



Results – Scenario G (Cumulative Scenario #3)

Effect of the scenario on daily RRF



January 2015 vs. May 2015 Model

TCEQ uploaded the latest version of modeling files and a revision to SIP plan on May 15, 2015. Major differences from the last update in January 6, 2015 are:

- NO_X and VOC are slightly increased in the DFW emission inventory
- RRFs are calculated using latest EPA guidance

January 2015 vs. May 2015 Model

TCEQ Report (Dec 10, 2014): [Revisions to the State of Texas Air Quality Implementation Plan for the Control of Ozone Air Pollution (p.ES-1)]

Table ES-1: Summary of 2006 Baseline and 2018 Future Year Anthropogenic Modeling Emissions for DFW

DFW Area Source Type	2006 NO_X (tpd)	2018 NO_X (tpd)	2006 VOC (tpd)	2018 VOC (tpd)
On-Road	265.87	113.36	113.15	55.63
Non-Road	88.75	39.87	63.84	32.80
Area Sources	29.02	30.76	290.46	284.94
Off-Road – Locomotives	29.97	18.90	1.72	0.93
Off-Road – Airports	12.78	13.06	4.46	3.55
Oil and Gas – Production	61.84	7.15	43.72	23.79
Oil and Gas – Drill Rigs	18.23	2.82	1.16	0.21
Point – Oil and Gas	11.53	16.37	21.82	26.02
Point – Electric Utilities	9.63	16.91	1.03	4.44
Point – Cement Kilns	22.08	17.64	1.94	0.78
Point – Other	14.31	6.62	25.65	20.43
Total	564.01	283.46	568.95	453.52

+5% +3% +1% +2%

TCEQ Report (May 15, 2015): [Revisions to the State of Texas Air Quality Implementation Plan for the Control of Ozone Air Pollution (p.ES-1)]

Table ES-1: Summary of 2006 Baseline and 2018 Future Year Anthropogenic Modeling Emissions for DFW

DFW Nonattainment Area Source Type	2006 NO_X (tpd)	2018 NO_X (tpd)	2006 VOC (tpd)	2018 VOC (tpd)
On-Road	284.27	119.69	116.50	62.20
Non-Road	98.06	42.13	64.69	33.02
Area Sources	29.02	30.76	290.46	284.94
Off-Road – Locomotives	29.97	17.86	1.72	0.89
Off-Road – Airports	12.78	13.06	4.46	3.55
Oil and Gas – Production	61.84	8.31	43.72	24.24
Oil and Gas – Drill Rigs	18.23	2.82	1.16	0.21
Point – Oil and Gas	11.53	16.37	21.82	26.02
Point – Electric Utilities	9.63	16.91	1.03	4.44
Point – Cement Kilns	22.08	17.64	1.94	0.78
Point – Other	14.31	6.62	25.65	20.43
Total	591.72	292.17	573.15	460.72

January 2015 vs. May 2015 Model

TCEQ Report (Dec 10, 2014): [Revisions to the State of Texas Air Quality Implementation Plan for the Control of Ozone Air Pollution (p.3-67)]

Table 3-42: RRF Calculations from the 2006 Baseline and 2018 Future Case

2006 DFW Area Monitor and CAMS Code	DFW Area Monitor Alpha Code	2006 Average of Days >75 ppb	2018 Average of Days >75 ppb	Relative Response Factor *(RRF)*
Denton Airport South - C56	DENT	89.04	73.15	0.8215
Eagle Mountain Lake - C75	EMTL	88.32	71.83	0.8133
Grapevine Fairway - C70	GRAP	91.68	76.63	0.8358
Keller - C17	KELC	91.06	75.01	0.8238
Fort Worth Northwest - C13	FWMC	89.87	73.92	0.8226
Frisco - C31	FRIC	87.42	72.90	0.8338
Dallas North #2 - C63	DALN	87.07	73.28	0.8416
Parker County - C76	WTFD	86.33	70.09	0.8119
Dallas Executive Airport - C402	REDB	84.93	70.77	0.8334
Cleburne Airport - C77	CLEB	83.41	68.94	0.8265
Arlington Municipal Airport - C61	ARLA	86.34	71.90	0.8328
Dallas Hinton Street - C401	DHIC	87.00	73.01	0.8392
Granbury - C73	GRAN	83.40	68.17	0.8174
Midlothian Tower - C94	MDLT	82.82	69.40	0.8379
Pilot Point - C1032	PIPT	88.03	72.38	0.8222
Rockwall Heath - C69	RKWL	82.99	70.14	0.8452
Midlothian OFW - C52	MDLO	83.19	69.88	0.8399
Greenville - C1006	GRVL	79.12	65.90	0.8329
Kaufman - C71	KAUF	79.74	66.40	0.8327

January 2015 vs. May 2015 Model

Table 3-41: RRF Calculations from the 2006 Baseline and 2018 Future Case

2006 DFW Area Monitor and CAMS Code	DFW Area Monitor Alpha Code	2006 Average of Days >75 ppb	2018 Average of Days >75 ppb	Relative Response Factor (RRF)
Denton Airport South - C56	DENT	88.97	73.14	0.8221
Eagle Mountain Lake - C75	EMTL	89.20	72.52	0.8130
Grapevine Fairway - C70	GRAP	92.15	76.94	0.8349
Keller - C17	KELC	90.49	74.66	0.8250
Fort Worth Northwest - C13	FWMC	89.69	74.03	0.8254
Frisco - C31	FRIC	87.58	73.04	0.8340
Dallas North #2 - C63	DALN	87.00	73.30	0.8425
Parker County - C76	WTFD	86.07	69.91	0.8123
Dallas Executive Airport - C402	REDB	84.94	70.82	0.8338
Cleburne Airport - C77	CLEB	83.27	68.84	0.8267
Arlington Municipal Airport - C61	ARLA	85.82	71.55	0.8337
Dallas Hinton Street - C401	DHIC	87.22	73.55	0.8432
Granbury - C73	GRAN	83.24	67.93	0.8161
Midlothian Tower - C94	MDLT	83.41	69.63	0.8347
Pilot Point - C1032	PIPT	87.67	72.11	0.8224
Rockwall Heath - C69	RKWL	82.69	69.99	0.8463
Midlothian OFW - C52	MDLO	84.31	70.44	0.8355
Greenville - C1006	GRVL	79.16	65.41	0.8263
Kaufman - C71	KAUF	79.49	66.24	0.8333

TCEQ Report (May 15, 2015): [Revisions to the State of Texas Air Quality Implementation Plan for the Control of Ozone Air Pollution (p.3-66)]

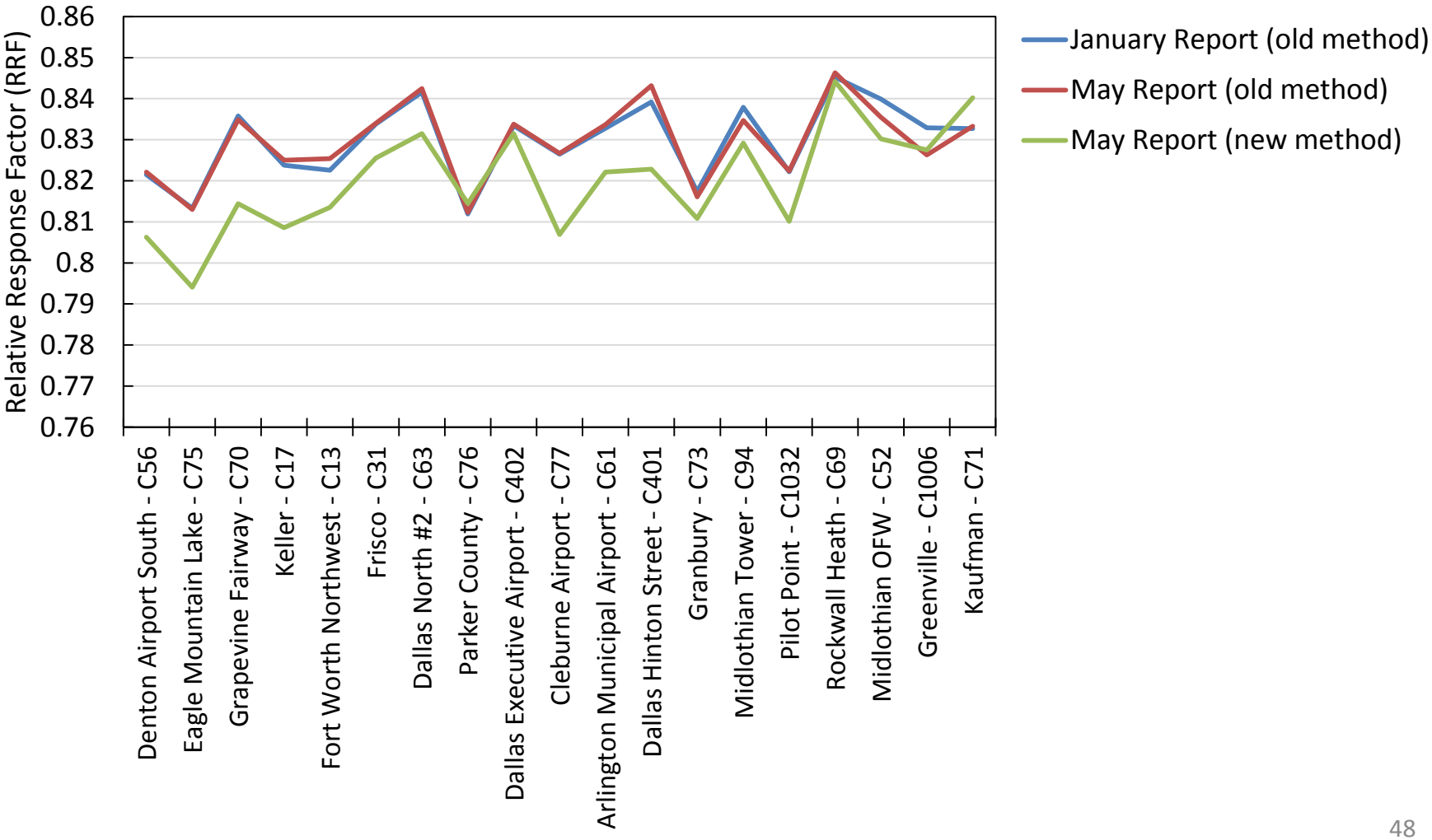
January 2015 vs. May 2015 Model

TCEQ Report (May 15, 2015): [Revisions to the State of Texas Air Quality Implementation Plan for the Control of Ozone Air Pollution (p.3-69)]

Table 3-43: RRF Calculations Using the 10 Highest Days

2006 DFW Area Monitor and CAMS Code	DFW Area Monitor Alpha Code	2006 Average of 10 Highest Days	2018 Average of 10 Highest Days	Relative Response Factor (RRF)
Denton Airport South - C56	DENT	102.48	82.63	0.8063
Eagle Mountain Lake - C75	EMTL	98.60	78.30	0.7941
Grapevine Fairway - C70	GRAP	105.69	86.07	0.8144
Keller - C17	KELC	102.29	82.71	0.8086
Fort Worth Northwest - C13	FWMC	100.54	81.79	0.8135
Frisco - C31	FRIC	99.36	82.02	0.8255
Dallas North #2 - C63	DALN	97.88	81.39	0.8315
Parker County - C76	WTFD	91.54	74.56	0.8145
Dallas Executive Airport - C402	REDB	95.76	79.62	0.8315
Cleburne Airport - C77	CLEB	88.54	71.44	0.8069
Arlington Municipal Airport - C61	ARLA	98.62	81.08	0.8221
Dallas Hinton Street - C401	DHIC	99.17	81.59	0.8228
Granbury - C73	GRAN	88.36	71.64	0.8108
Midlothian Tower - C94	MDLT	91.00	75.46	0.8292
Pilot Point - C1032	PIPT	99.39	80.52	0.8101
Rockwall Heath - C69	RKWL	89.84	75.84	0.8442
Midlothian OFW - C52	MDLO	92.22	76.56	0.8302
Greenville - C1006	GRVL	81.51	67.46	0.8275
Kaufman - C71	KAUF	81.94	68.84	0.8402

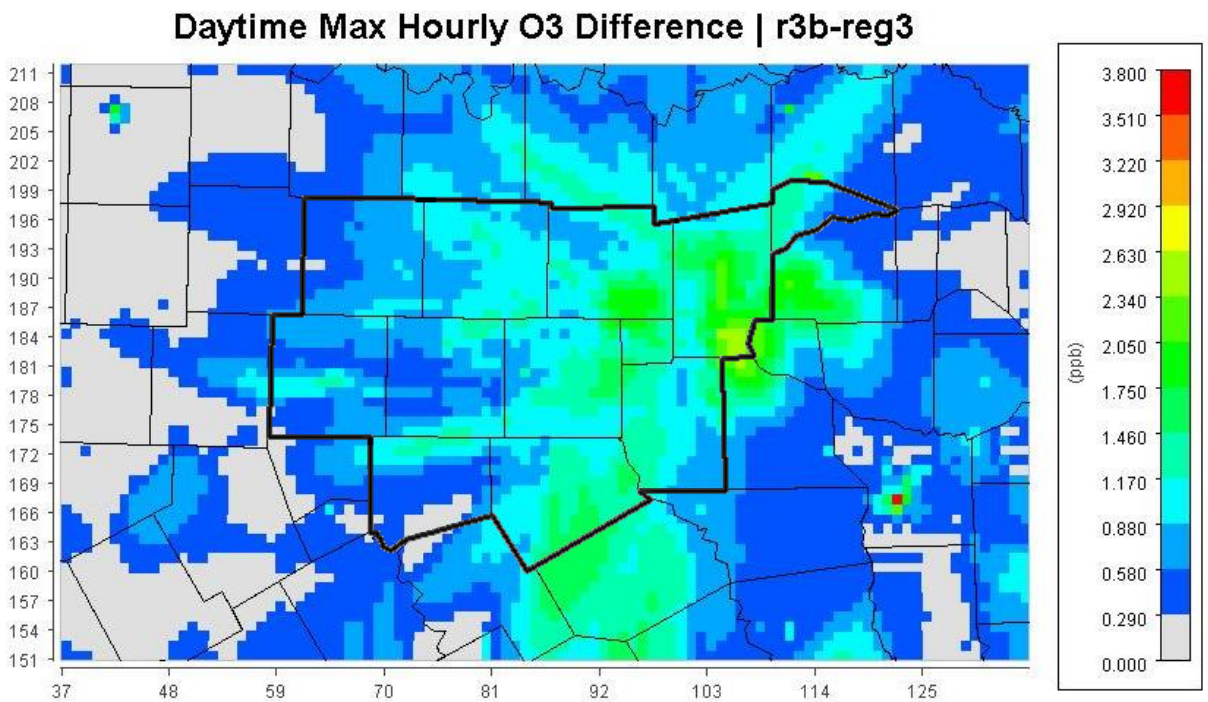
January 2015 vs. May 2015 Model



January 2015 vs. May 2015 Model

Baseline 2006 Cases

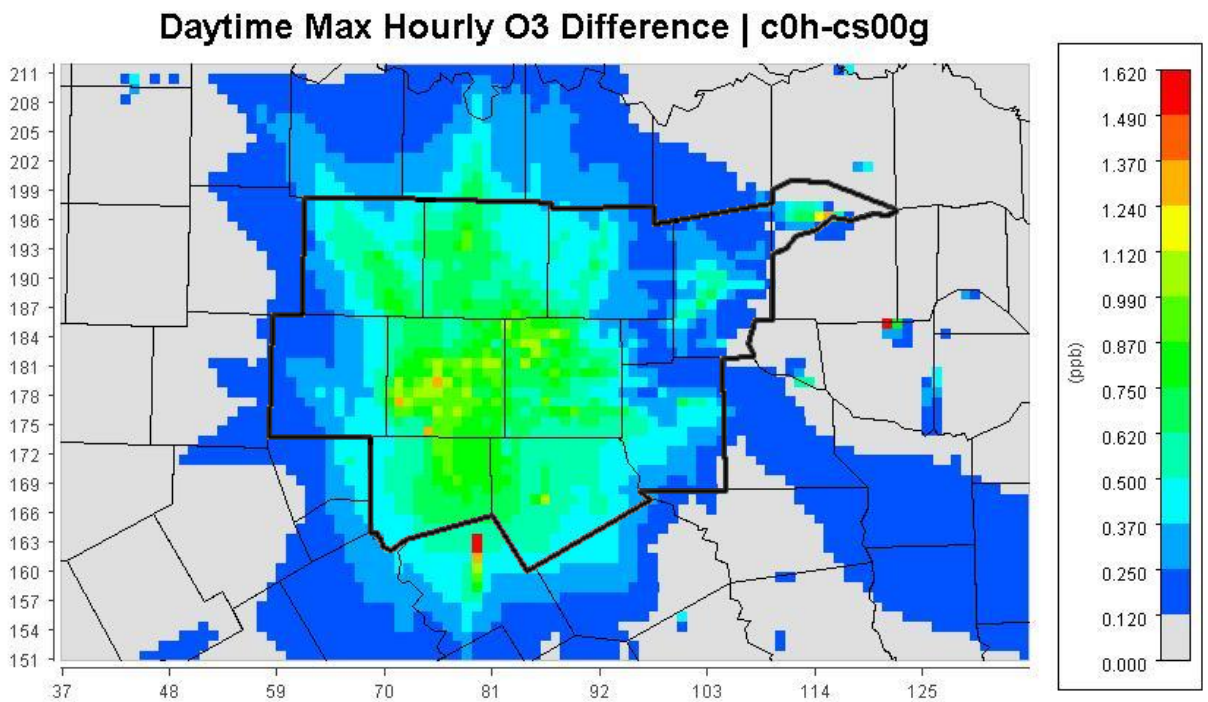
bl06r3b (May 2015 Model) – bl06reg3 (Jan 2015 Model)
Maximum episodic daily max 8hr mean O3 difference – 67 days



January 2015 vs. May 2015 Model

Future Year 2018 Cases

FY18c0h (May 2015 Model) – FY18cs00g (Jan 2015 Model)
Maximum episodic daily max 8hr mean O3 difference – 67 days



UNT Preliminary Results with Revised SIP submission files

- A test case: **cs00g** (*Jan 2015 files*) vs **c0h** (*May 2015 files*)
- **Cumulative Scenario** (v12):
  - 100% NOx reduction at the coal plants
  - 90% NOx reduction at the cement kilns
  - 100% NOX reduction at Barnett Shale large compressors

UNT Preliminary Results

Maximum absolute difference of 8hr-mean O_3 predicted in 3x3 cells near CAMS (FY18 - Scenario)

cs00g

CAMS	v12.cs00g 67-day episode
Ft. Worth Northwest-C13	4.5
Keller-C17	3.5
Frisco - C31	4.6
Midlothian OFW - C52	5.8
Denton Airport South - C56	3.8
Arlington - C61	6.8
Dallas North - C63	4.4
Rockwall - C69	6.5
Grapevine - C70	4.8
Kaufman - C71	7.7
Granbury - C73	4.8
Eagle Mt. Lake - C75	4.0
Parker County - C76	4.5
Cleburne Airport - C77	4.9
Midlothian Tower - C94	5.3
Dallas Hinton St. - C401	5.6
Dallas Exec. Airport - C402	5.3
Itally/Ellis - C650	6.3
Greenville - C1006	6.5
Pilot Point - C1032	4.2

c0h

CAMS	V12.c0h 67-day episode
Ft. Worth Northwest-C13	4.6
Keller-C17	3.6
Frisco - C31	4.6
Midlothian OFW - C52	5.9
Denton Airport South - C56	3.9
Arlington - C61	6.9
Dallas North - C63	4.5
Rockwall - C69	6.5
Grapevine - C70	4.9
Kaufman - C71	7.7
Granbury - C73	4.8
Eagle Mt. Lake - C75	4.1
Parker County - C76	4.5
Cleburne Airport - C77	5.0
Midlothian Tower - C94	5.3
Dallas Hinton St. - C401	5.6
Dallas Exec. Airport - C402	5.3
Itally/Ellis - C650	6.3
Greenville - C1006	6.5
Pilot Point - C1032	4.2

UNT Preliminary Results

Change in Relative Response Factor (FY18 → Scenario) using the 10 highest days

cs00g

CAMS	v12.cs00g 67-day episode
Ft. Worth Northwest-C13	0.821 → 0.805
Keller-C17	0.817 → 0.804
Frisco - C31	0.827 → 0.815
Midlothian OFW - C52	0.825 → 0.802
Denton Airport South - C56	0.813 → 0.799
Arlington - C61	0.826 → 0.810
Dallas North - C63	0.837 → 0.826
Rockwall - C69	0.844 → 0.831
Grapevine - C70	0.820 → 0.807
Kaufman - C71	0.852 → 0.827
Granbury - C73	0.815 → 0.795
Eagle Mt. Lake - C75	0.806 → 0.795
Parker County - C76	0.825 → 0.812
Cleburne Airport - C77	0.819 → 0.791
Midlothian Tower - C94	0.825 → 0.801
Dallas Hinton St. - C401	0.829 → 0.816
Dallas Exec. Airport - C402	0.832 → 0.819
Itally/Ellis - C650	0.824 → 0.805
Greenville - C1006	0.834 → 0.819
Pilot Point - C1032	0.814 → 0.803

c0h

CAMS	v12.c0h 67-day episode
Ft. Worth Northwest-C13	0.813 → 0.796
Keller-C17	0.808 → 0.795
Frisco - C31	0.826 → 0.814
Midlothian OFW - C52	0.831 → 0.807
Denton Airport South - C56	0.811 → 0.798
Arlington - C61	0.821 → 0.805
Dallas North - C63	0.833 → 0.822
Rockwall - C69	0.850 → 0.838
Grapevine - C70	0.813 → 0.801
Kaufman - C71	0.840 → 0.816
Granbury - C73	0.811 → 0.791
Eagle Mt. Lake - C75	0.802 → 0.791
Parker County - C76	0.821 → 0.809
Cleburne Airport - C77	0.808 → 0.780
Midlothian Tower - C94	0.830 → 0.807
Dallas Hinton St. - C401	0.823 → 0.809
Dallas Exec. Airport - C402	0.832 → 0.819
Itally/Ellis - C650	0.806 → 0.787
Greenville - C1006	0.828 → 0.813
Pilot Point - C1032	0.811 → 0.800

Concluding Thoughts

- We are currently re-running the entire set of simulations with the revised modeling files.
- The 2011 episodes would have provided a more recent modeling scenario for the SIP submission.
- Currently, there are no cost-benefit analysis conducted on the efficacy of each control strategies.

Concluding Thoughts

- The model seems to respond favorably to more NOx controls in the region.
- Unsure whether the VOC profiles are accurately capturing the recent emission surges in the region.
- Additional point and area controls are necessary for the area to achieve the attainment goals for DFW. These may get an additional 1-2 ppb reduction on the future design value.
- Upwind coal-fired power plants and major point and area emission sources in the vicinity provide additional opportunities for further emission reduction.

THANK YOU!!

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Sierra Club Ex. 5

Appendix A. Modeling Methods

Photochemical Grid Model and Source Apportionment

To quantify the ozone impacts due to precursor emissions from individual power plants and other source groups, STI performed CAMx OSAT source apportionment model simulations for the 2011 ozone season (May to September). The modeling domain and configurations used were based on those developed by EPA in recent ozone transport assessments using CAMx OSAT (U.S. Environmental Protection Agency, 2014a), and included the use of the carbon-bond 6 revision 2 gas phase chemistry mechanism.

The Comprehensive Air Quality Model with Extensions (CAMx version 6.1) (ENVIRON International Corporation, 2014) is a publically available, peer-reviewed, state-of-the-science three-dimensional grid-based (Eulerian) photochemical air quality model designed to simulate the emission, transport, diffusion, chemical transformation, and removal of gaseous and particle pollutants in the atmosphere over spatial scales ranging from continental to urban. CAMx was designed to approach air quality as a whole by including capabilities for modeling multiple air quality issues, including tropospheric ozone, fine particles, visibility degradation, acid deposition, air toxics, and mercury. The ability of photochemical grid models such as CAMx to treat a large number of sources and their chemical interactions makes them well suited for assessing the impacts of natural and anthropogenic emissions sources on air quality. CAMx is widely used to support regulatory air quality assessments and air quality management policy decisions in the United States In recent years, the EPA has used CAMx to support the NAAQS designation process (U.S. Environmental Protection Agency, 2014a) and evaluate interstate pollutant transport (U.S. Environmental Protection Agency, 2005).

CAMx also includes Ozone Source Apportionment Technology (OSAT), which can be used to estimate the contributions of individual sources, groups of sources, or source regions to ozone concentrations at a given receptor location (Yarwood et al., 1996). Source apportionment modeling is useful for understanding model performance, designing emission control strategies, and performing culpability assessments to identify emission sources that contribute significantly to pollution (ENVIRON International Corporation, 2010). The key precursor species for ozone production are volatile organic compounds (VOC) and oxides of nitrogen (NO_x). OSAT uses reactive tracers to track the fate of these precursor emissions and the ozone formation resulting from them within a CAMx simulation. The ozone and precursors are tracked and apportioned by OSAT without perturbing the host model chemistry; therefore the OSAT results are fully consistent with the host model results for total concentrations. OSAT can efficiently estimate source contributions from multiple emission sources within a single model simulation. Importantly, while source apportionment modeling can be used to estimate source contributions to ozone concentrations for a given set of emission inputs, sensitivity modeling approaches such as brute-force modeling[4] or the direct decoupled method (DDM)[5] are

[4] The brute-force modeling method involves running the model both with and without emission controls applied to the source(s) of interest. The difference in pollutant concentrations between the two simulations yields the impact of the emission control scenario.
[5] DDM provides sensitivity coefficients that relate emissions changes to model outcomes. These sensitivity coefficients can be used to evaluate how pollutant concentrations would respond to a range of changes in emissions from a source or group of sources.

needed to quantify the effect of a given emission control scenario (e.g., 90% NO_x reduction at power plants) on ozone concentrations.

In this work, the Anthropogenic Precursor Culpability Assessment (APCA) extension of OSAT was used. APCA is based on OSAT, but calculates source contributions a little differently to recognize the fact that biogenic (or non-anthropogenic) emissions are not controllable. For example, when ozone is formed by reactions between biogenic VOC and anthropogenic NO_x, APCA apportions the ozone contribution entirely to the anthropogenic source. APCA only apportions ozone contributions to biogenic sources when both the VOC and NO_x precursors are from biogenic sources. APCA is useful for determining which source controls might have the greatest effect at reducing ozone concentrations.

2011 EPA Modeling Platform

The CAMx OSAT simulations were based on EPA's 2011 modeling platform. A modeling platform consists of a structured system of connected data and models that provide a consistent and transparent basis for assessing the air quality impact of anticipated changes in emissions. EPA develops and evaluates a new modeling platform each time the National Emissions Inventory (NEI) is updated (every three years). EPA has used the 2011 modeling platform to support development of revised ozone NAAQS (U.S. Environmental Protection Agency, 2014a) and to quantify future-year interstate contributions to ozone concentrations to help states address their obligations under the "Good Neighbor" provision of the Clean Air Act for the 2008 ozone NAAQS (U.S. Environmental Protection Agency, 2015).

The CAMx OSAT simulations relied on EPA's 2011v6.1 modeling platform, which was based on the 2011 NEI, Version 1 (2011NEIv1). The NEI is compiled by EPA on a triennial basis, primarily from data submitted by state, local, and tribal air agencies, and the 2011 NEI includes emissions from five source sectors: point sources, nonpoint (or area) sources, onroad mobile sources, nonroad mobile sources, and fire events.

For air quality modeling purposes, the 2011 NEI data was augmented by EPA to include biogenic emissions and data from Canadian and Mexican emissions inventories. In addition, the annualized point source data for electrical generating units (EGUs) in the 2011 NEI were replaced with hourly 2011 continuous emissions monitoring (CEMS) data for SO_2 and NO_x. Annual emissions for pollutants were converted to an hourly basis using CEMS input data (U.S. Environmental Protection Agency, 2011).

Source Apportionment Tagging

After obtaining the 2011 modeling platform from EPA, STI worked with the Sierra Club and state air agencies in Connecticut, Delaware, and Maryland to identify sources and source groups to be tagged for ozone attribution analysis. Tagged sources fell into one of the following general categories:

- Individual coal-fired power plants (in some cases, specific coal-fired EGUs within a single facility were tagged separately);
- Groups of coal-fired power plants within a state or sub-state region (e.g., downstate New York);
- Groups of other (non-EGU) point sources within a state or sub-state region; and
- Non-point source sectors (e.g., biogenic sources and onroad mobile sources) within a state, sub-state, or multi-state region (e.g., states in the Southeast States Air Resources Managers [SESARM] consortium).

A total of 52 EGUs were individually tagged, while several dozen additional EGUs were tagged within 61 state and sub-state regions. Point sources that were tagged individually were not included in any of the state- or sub-state-level tag groups. In addition, each non-point source sector was tagged within 15 state, sub-state, or multi-state regions. Because of the large number of tags modeled, the processing was divided in to three separate CAMx OSAT simulations. Brunner Island is represented by source tag I7 in Simulation 1. More detailed information on sources tagged in the CAMx OSAT simulations is provided in **Appendix B**.

Meteorology

Meteorological inputs for the CAMx-OSAT simulations were developed by EPA for the 2011 modeling platform using version 3.4 of the Weather Research and Forecasting (WRF) numerical weather prediction model (Skamarock et al., 2008). The meteorological outputs from WRF include hourly varying winds, temperature, moisture, vertical diffusion rates, clouds, and rainfall rates. Additional details about this WRF simulation and its performance evaluation can be found in U.S. Environmental Protection Agency (2014b).

Initial and Boundary Conditions

Initial and lateral boundary conditions were developed from three-dimensional global atmospheric chemistry simulations with GEOS-Chem standard version 8-03-02 with 8-02-01 chemistry (**http://geos-chem.org**) provided with the EPA 2011 platform. The GEOS-Chem predictions were translated into CAMx-ready initial and boundary conditions using code and procedures developed by Henderson et al. (2014), and modifications provided to STI by the Lake Michigan Air Directors Consortium (LADCO) to accommodate carbon-bond 6 chemistry species. OSAT tracks ozone transported through the boundaries, as well as ozone formation resulting from precursor emissions transported through the boundaries.

Post-Processing

The raw result from a CAMx OSAT simulation is hourly ozone contributions from each source tag at each grid cell in the modeling domain for the 2011 ozone season. These hourly contributions were extracted and post-processed for several hundred receptor sites, listed in the electronic attachment

provided with this memorandum. The receptors correspond to quality monitoring sites across the eastern half of the United States, and include sites of specific interest to northeastern states, as well as monitors with current ozone design values exceeding 65 ppb. At each receptor and for each day, the 8-hr average ozone contribution was calculated for all source tags using the averaging period corresponding to the period of highest modeled 8-hr average concentration at the receptor location. Although this analysis approach may not capture the largest ozone contributions modeled during the day, it does reflect contributions during time periods when ozone concentrations are highest. This analysis approach also ensures that ozone contributions from all source tags[6] sum to total modeled 8-hr ozone concentration each day. The post-processed OSAT results were compiled into Microsoft Access databases to facilitate future data mining and analysis.

Model Performance Evaluation

EPA evaluated its 2011 modeling platform using statistical assessments of model predictions versus observations paired in time and space. Overall, the model performance statistics for ozone were within or close to the ranges found in other peer-reviewed applications (Simon et al., 2012) and were found to be suitable for use in a regulatory context (U.S. Environmental Protection Agency, 2014a).

As an example of how the 2011 modeling platform was performing in southeast Pennsylvania, **Figure 9** shows a time-series comparison between modeled and monitored peak 8-hr ozone concentrations at the Sipe Avenue monitor in Harrisburg. The modeled ozone concentrations will not typically show perfect agreement with observed concentrations. For the Sipe Avenue monitor, the model performs well and captures observed ozone trends throughout the 2011 ozone season quite well, but tends to under-predict ozone concentrations when monitored concentrations are highest.

[6] Including a leftover residual contribution from all untagged sources calculated by CAMx.

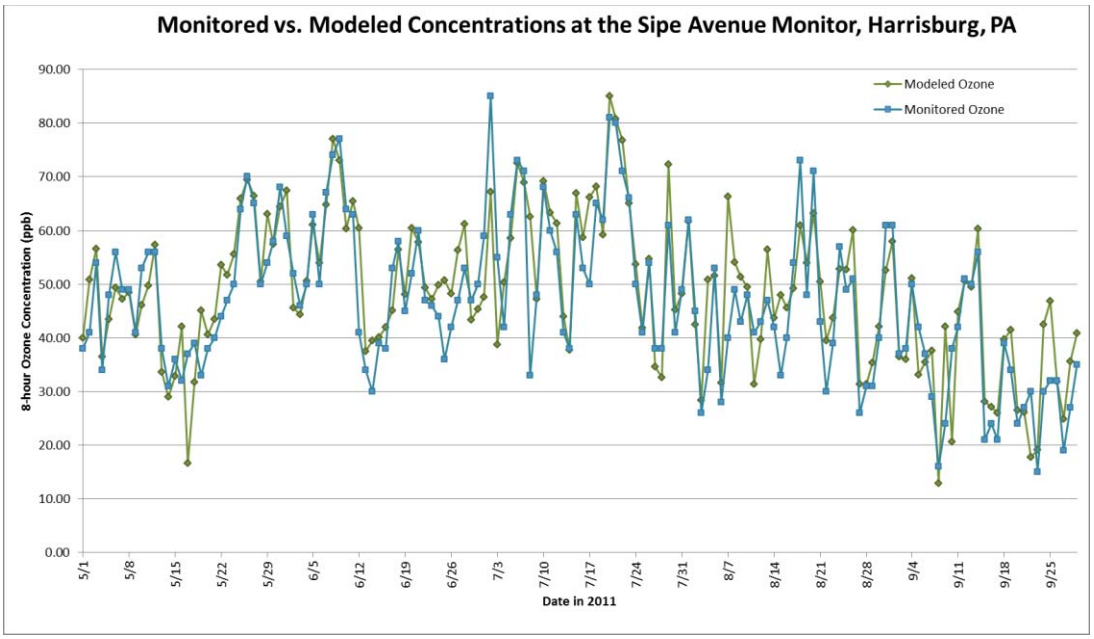

Figure 9. Monitored vs. modeled 8-hr ozone concentrations at the Sipe Avenue monitor near Harrisburg.

Appendix B. OSAT Source Tags

This information is also included in the Access database of OSAT results provided to the Sierra Club. Point source state groups (e.g., PA1, MDALL, and CTOTH) do not include point sources that were already tagged individually or point sources included in other state groupings from the same state.

Simulation 1

Tag Name	State	Tag Description
IC	N/A	Initial Conditions
BC	N/A	Boundary Conditions
biog	N/A	Biogenics
I2	CT	Bridgeport Station
I5	PA	Conemaugh
I6	PA	Homer City Station
I7	PA	PPL Brunner Island
I10	PA	Bruce Mansfield
I11	PA	Keystone
I12	PA	PPL Montour
II7	VA	Chesterfield
II9	WV	Pleasants Power Station
I23	IL	E D Edwards
I28	WV	Harrison Power Station
I30	WV	Fort Martin Power Station
I32	WV	John E Amos
I33	MI	St Clair
I34	MI	Trenton Channel
I35	IN	Clifty Creek
I36	IL	Wood River
I37	IL	Waukegan
I38	OH	Kyger Creek
I39	IL	Will County
I40	OH	Cardinal
I41	MI	J H Campbell
I43	OH	General James M Gavin
I44	OH	W H Sammis
I45	IL	Powerton
I46	MI	River Rouge

Tag Name	State	Tag Description
I49	PA	Cheswick Power Plant
IL1	IL	Illinois point group 1
IL2	IL	Illinois point group 2
IN1	IN	Indiana point group 1
IN2	IN	Indiana point group 2
MD	MD	Maryland point group
MI	MI	Michigan point group
NJ1	NJ	Illinois point group 1
NJ2	NJ	Illinois point group 2
NY	NY	New York point group
OH1	OH	Ohio point group 1
OH2	OH	Ohio point group 2
PA1	PA	Pennsylvania point group 1
PA2	PA	Pennsylvania point group 2
VA1	VA	Virginia point group 1
VA2	VA	Virginia point group 2
WV	WV	West Virginia point group
NYEGU	NY	New York EGUs not individually tagged
NYUOTH	NY	Non-EGU point sources in upstate New York
NYDCMB	NY	New York "downstate" combustion sources
NYDOTH	NY	New York "downstate" point sources
PAEGU	PA	Pennsylvania EGUs not individually tagged
PAOTH	PA	Other Pennsylvania sources
NJCMB	NJ	New Jersey CMB sources
NJOTH	NJ	Other New Jersey point sources
CTCMB	CT	Connecticut combustion sources
CTOTH	CT	Other Connecticut point sources
MDALL	MD	Other Maryland point sources
VAALL	VA	Other Virginia point sources
OHALL	OH	Other Ohio point sources
INALL	IN	Other Indiana point sources
OTHER	N/A	CAMx "residual" contribution
total	N/A	Total ozone concentration

Simulation 2

Tag Name	Tag Description
IC	Initial conditions
BC	Boundary conditions
biog_oth	Biogenic emissions from states not included in tagging
biog_CT	Connecticut biogenics
biog_DC	Washington D. C. biogenics
biog_IL	Illinois biogenics
biog_IN	Indiana biogenics
biog_MD	Maryland biogenics
biog_MI	Michigan biogenics
biog_NJ	New Jersey biogenics
biog_NYD	New York "downstate" biogenics
biog_NYU	New York "update" biogenics
biog_OH	Ohio biogenics
biog_PA	Pennsylvania biogenics
biog_SESARM	Biogenics from SESARM states
biog_VA	Virginia biogenics
biog_WV	West Virginia biogenics
biog_DE	Delaware biogenics
nonr_oth	Non-road emissions from states not included in tagging
nonr_CT	Connecticut non-road
nonr_DC	Washington D. C. non-road
nonr_IL	Illinois non-road
nonr_IN	Indiana non-road
nonr_MD	Maryland non-road
nonr_MI	Michigan non-road
nonr_NJ	New Jersey non-road
nonr_NYD	New York "downstate" non-road
nonr_NYU	New York "update" non-road
nonr_OH	Ohio non-road
nonr_PA	Pennsylvania non-road
nonr_SESARM	non-road from SESARM states
nonr_VA	Virginia non-road
nonr_WV	West Virginia non-road
nonr_DE	Delaware non-road

Tag Name	Tag Description
onr_oth	Onroad emissions from states not included in tagging
onr_CT	Connecticut onroad
onr_DC	Washington D. C. onroad
onr_IL	Illinois onroad
onr_IN	Indiana onroad
onr_MD	Maryland onroad
onr_MI	Michigan onroad
onr_NJ	New Jersey onroad
onr_NYD	New York "downstate" onroad
onr_NYU	New York "update" onroad
onr_OH	Ohio onroad
onr_PA	Pennsylvania onroad
onr_SESARM	onroad from SESARM states
onr_VA	Virginia onroad
onr_WV	West Virginia onroad
onr_DE	Delaware onroad
othr_oth	Other emissions (not addressed by the onroad, non-road, and biogenic tags) from states not included in tagging
othr_CT	Other emissions from Connecticut
othr_DC	Other emissions from Washington, DC
othr_IL	Other emissions from Illinois
othr_IN	Other emissions from Indiana
othr_MD	Other emissions from Maryland
othr_MI	Other emissions from Michigan
othr_NJ	Other emissions from New Jersey
othr_NYD	Other emissions from downstate New York
othr_NYU	Other emissions from upstate New York
othr_OH	Other emissions from Ohio
othr_PA	Other emissions from Pennsylvania
othr_SESARM	Other emissions from SESARM states
othr_VA	Other emissions from Virginia
othr_WV	Other emissions from West Virginia
othr_DE	Other emissions from Delaware
total_icbc	Total initial and boundary conditions
total_biog	Total biogenic emissions
total_nonr	Total nonroad emissions

Tag Name	Tag Description
total_onr	Total onroad emissions
total_othr	Total other emissions
total	Total ozone concentration

Simulation 3

Tag Name	State	Plant Name
IC	N/A	Initial conditions
BC	N/A	Boundary conditions
biog	N/A	Biogenics
OTHER	N/A	CAMx "residual" contribution
total	N/A	Total ozone concentration
I1	DE	Indian River Generating Station
I3	AR	White Bluff
I4	AR	Independence
I6	TX	Big Brown
I8	GA	Hammond
I9	KS	Tecumseh Energy Center
I13	TX	W A Parish
II4	TX	Coleto Creek
II5	TX	Monticello
II6	TX	Fayette Power Project (a.k.a. Sam Seymour)
II8	TX	Martin Lake
I20	TX	Pirkey
I21	TN	Kingston
I22	KY	Kenneth C Coleman
I24	TN	Gallatin
I25	KY	Elmer Smith
I26	KY	E W Brown
I27	KY	Shawnee
I29	MO	Thomas Hill
I31	MO	Sioux
I42	NC	G G Allen
I47	GA	Scherer
I48	NC	Marshall
I50	OK	Muskogee

Tag Name	State	Plant Name
I51	OK	GRDA
AL1	AL	Alabama point group 1
AL2	AL	Alabama point group 2
AR	AR	Arkansas point group
FL1	FL	Florida point group 1
FL2	FL	Florida point group 2
GA	GA	Georgia point group
IA1	IA	Iowa point group 1
IA2	IA	Iowa point group 2
KS	KS	Kansas point group
KY1	KY	Kentucky point group 1
KY2	KY	Kentucky point group 2
LA	LA	Louisiana point group
MA	MA	Massachusetts point group
MN1	MN	Minnesota point group 1
MN2	MN	Minnesota point group 2
MO	MO	Missouri point group
MS1	MS	Mississippi point group 1
MS2	MS	Mississippi point group 2
NC	NC	North Carolina group
NE1	NE	Nebraska group
NH	NH	New Hampshire point group
OK1	OK	Oklahoma point group 1
OK2	OK	Oklahoma point group 2
SC1	SC	South Carolina point group 1
SC2	SC	South Carolina point group 2
TN1	TN	Tennessee point group 1
TN2	TN	Tennessee point group 2
TX1	TX	Texas point group 1
TX2	TX	Texas point group 2
WI1	WI	Wisconsin point group 1
WI2	WI	Wisconsin point group 2

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Addendum: Aggregate Ozone Contributions from Pennsylvania Coal-Fired Power Plants

In addition to analyzing the modeled ozone contributions due to Brunner Island emissions, we also analyzed aggregate ozone contributions due to emissions from the 21 Pennsylvania coal-fired power plants listed in Table 3. In 2011, the combined NO_x emissions from these power plants were about 100,000 tons, with over 75% of these NO_x emissions coming from five power plants: Keystone, Conemaugh, Brunner Island, Bruce Mansfield, and Montour. The Keystone, Conemaugh, and Brunner Island power plants are the second, third, and fourth highest NO_x emitters of all tagged power plants in the source apportionment modeling.

Table 3. Pennsylvania coal-fired power plants included in the aggregate ozone impact analysis, with 2011 NO_x emissions (tons).

Tag Name	Plant Name	2011 NO_x Emissions (tons)
I5	Conemaugh	17,553
I6	Homer City Station	9,022
I7	PPL Brunner Island	16,887
I10	Bruce Mansfield	11,550
I11	Keystone	20,759
I12	PPL Montour	12,714
I49	Cheswick Power Plant	3,293
PA1	Cambria Cogen Colver Power Project Ebensburg Power Foster Wheeler Mt. Carmel Cogen G F Weaton Power Station John B. Rich Memorial Power Station Kline Township Cogen Facility Northampton Generating Company LP Panther Creek Energy Facility Scrubgrass Generating Company LP Seward St. Nicholas Cogen Project Wheelabrator Frackville Energy WPS Westwood Generation LLC	7,397

The modeled 8-hr ozone contribution from each Pennsylvania power plant in Table 3 was summed at each ozone monitor in Pennsylvania and its neighboring states. Emissions from these Pennsylvania coal-fired power plants contribute significantly to ozone formation in Pennsylvania and neighboring states during the modeled ozone season. Modeled 8-hr ozone impacts were as large as 18 ppb in Pennsylvania (Strongstown monitor in Indiana County), and as large as about 4 to 9 ppb in neighboring states. Impacts considered significant (>1% of the current ozone NAAQS) were modeled on as many as 108 days at a single Pennsylvania monitor during the single ozone season. Significant ozone impacts were modeled at one or more Pennsylvania monitors on almost every modeled day (144 out of 152) during the ozone season.

Table 4 summarizes the number of times during the 2011 ozone season that the combined emissions from Pennsylvania coal-fired power plants were a significant contributor to the total 8-hr ozone concentration at air quality monitors in Pennsylvania and five neighboring states. The table also includes the peak modeled contributions at monitors in each state, as well as the average and 75th percentile of *significant* modeled ozone contributions from the power plants at monitors in each state.

Table 4. Summary of significant (>0.75 ppb) modeled 8-hr ozone contributions from Pennsylvania coal-fired power plants at monitoring stations in Pennsylvania and neighboring states. A "monitor-day" refers to one occurrence of a significant ozone contribution at one monitor. Peak modeled contributions at ozone monitors in each state, as well as the average and 75th percentile of significant contributions in each state, are also included.

State	Monitors with Significant Ozone Contributions	Maximum Number of Days any One Monitor had a Significant Ozone Contribution	Monitor-Days with Significant Ozone Contributions	Peak Ozone Contribution (ppb)	Average of Significant Ozone Contributions (ppb)	75th Percentile of Significant Ozone Contributions (ppb)
Pennsylvania	53	108	2940	18.32	2.57	3.29
Connecticut	12	22	169	3.86	1.46	1.81
Delaware	7	63	345	8.79	1.95	2.38
Maryland	20	71	1097	8.32	1.99	2.52
New Jersey	17	43	535	7.01	2.00	2.61
New York	28	40	555	6.23	1.72	2.17

Sierra Club Ex. 6

"Ex. 6 Big Brown, Monticello, Martin Lake Impacts on DFW.xlsx"

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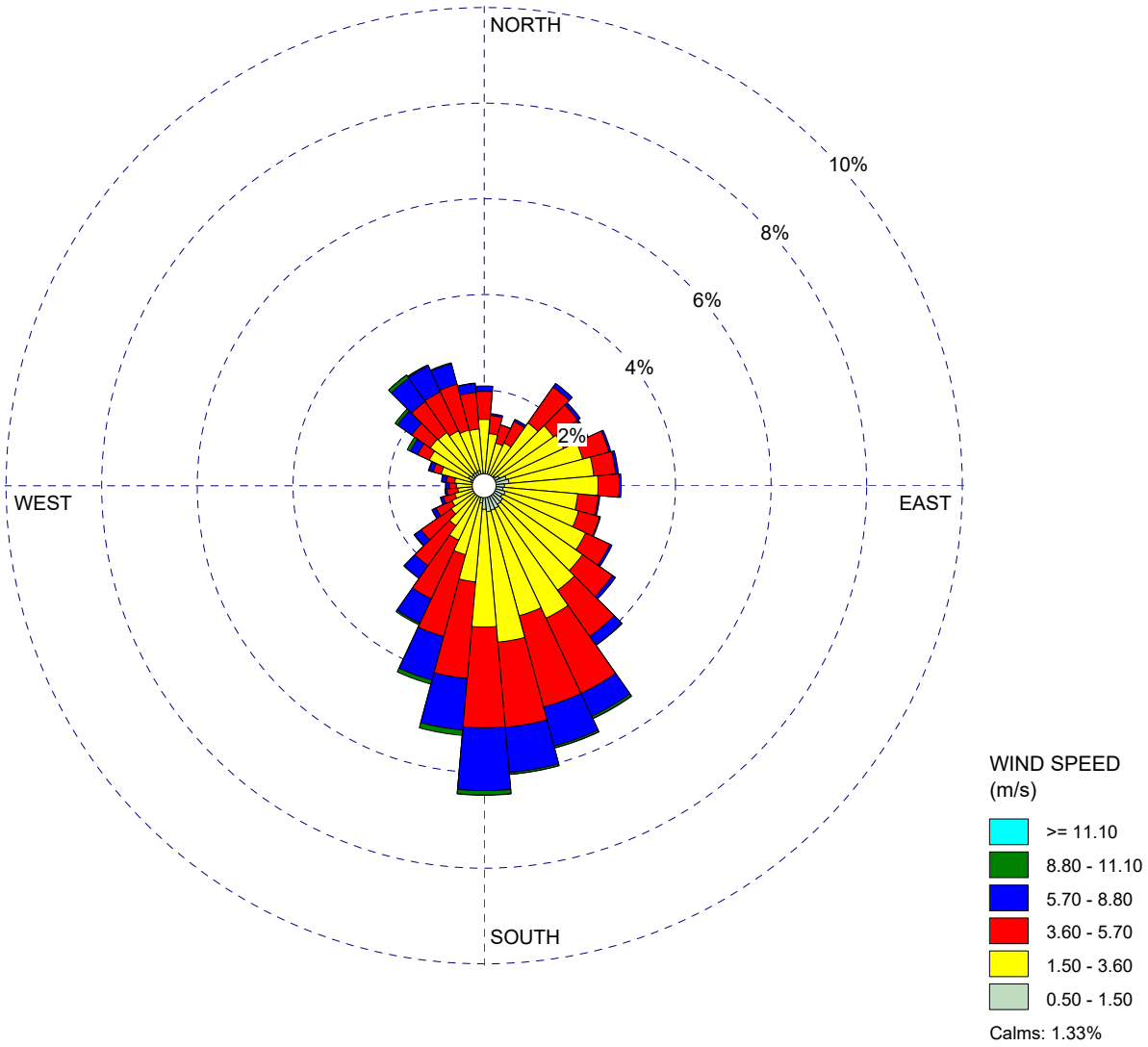
Sierra Club Ex. 7

WIND ROSE PLOT:

Longview, Texas
Wind Rose for 2013-15 Period

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
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	CALM WINDS: **1.33%**	TOTAL COUNT: **26196 hrs.**	
	AVG. WIND SPEED: **3.40 m/s**	DATE: **4/10/2016**	PROJECT NO.:

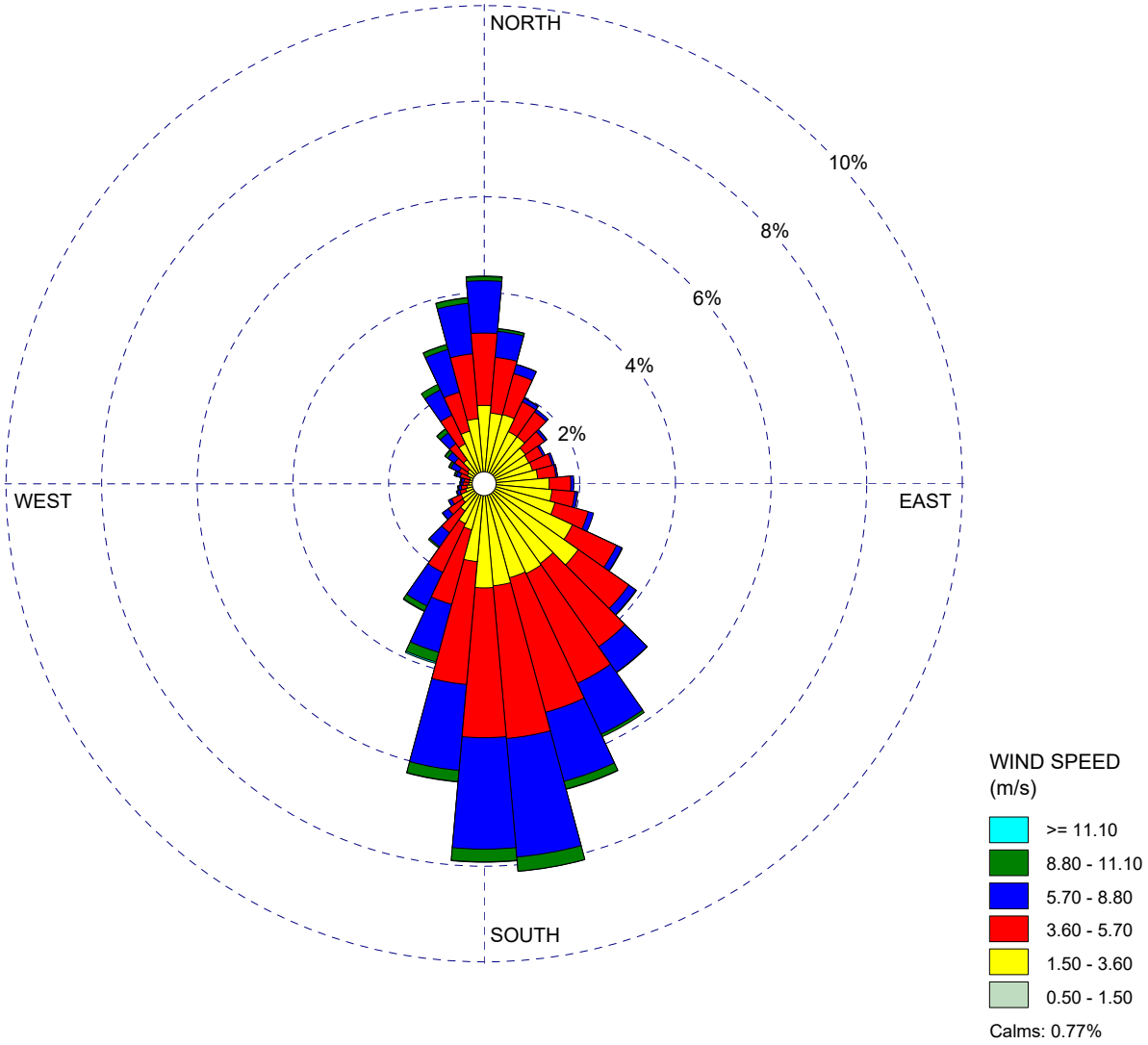
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Corsicana, Texas
Wind Rose for 2013-15 Period

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
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	AVG. WIND SPEED: **4.24 m/s**	DATE: **4/10/2016**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software