Texas 2015 Ozone NAAQS Transport SIP

Presented at:

SOUTHEAST TEXAS PHOTOCHEMICAL MODELING TECHNICAL COMMITTEE (SET PMTC)

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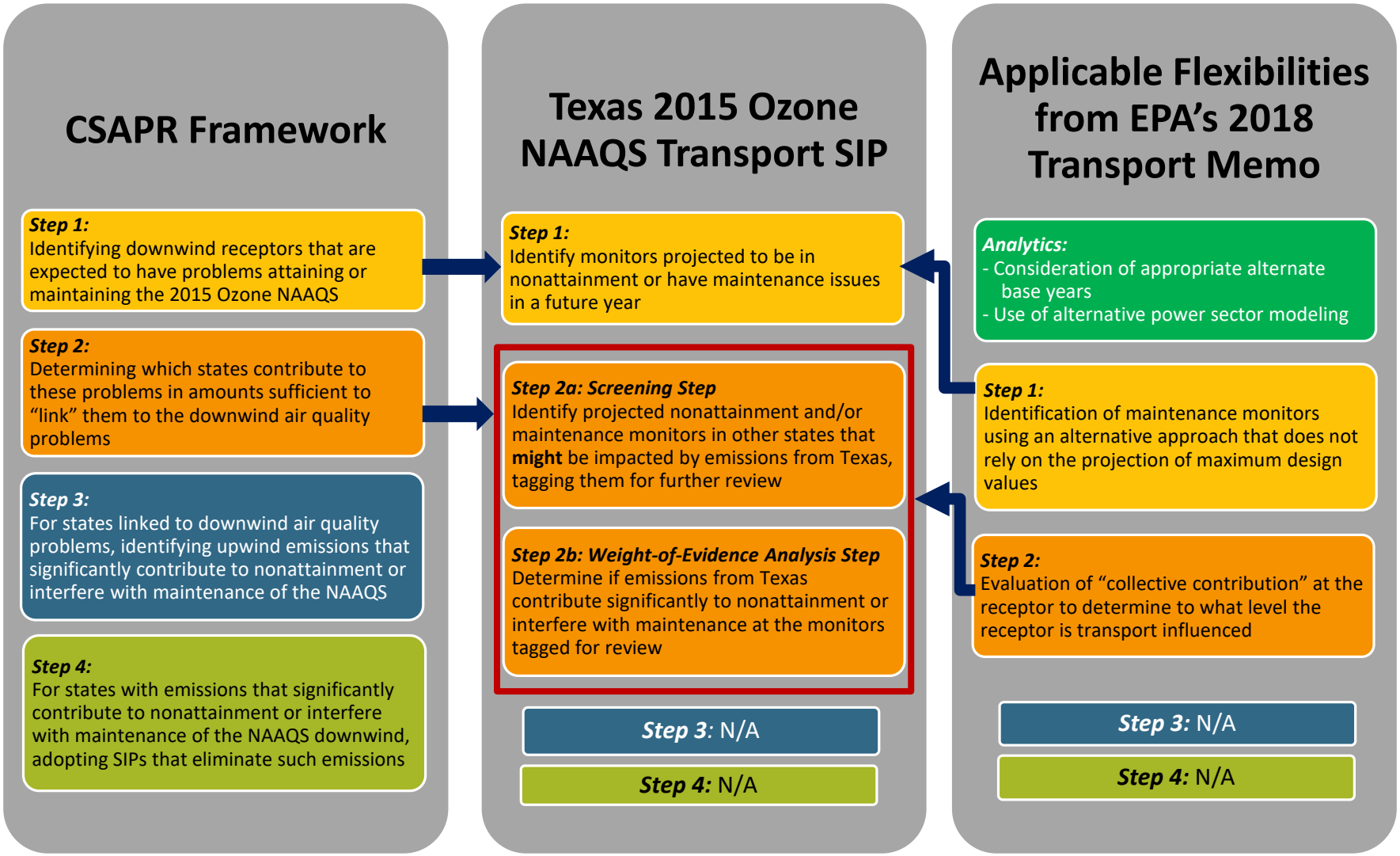
Summary of the Texas 2015 Ozone NAAQS Transport SIP

- Utilized photochemical modeling and data analysis to meet the requirements of the "Good Neighbor" provision of the Federal Clean Air Act (FCAA, §110(a)(2)(D)(i)(I)) for the 2015 eight-hour ozone National Ambient Air Quality Standard (2015 ozone NAAQS).
- Modeling and analysis is mostly based on the Transport modeling framework published in the EPA's January 6, 2017 NODA for the 2015 ozone NAAQS but with several key improvements.
  - Accounting for meteorological variability **and** emissions reductions in the identification of projected maintenance monitors
  - A contribution calculation methodology consistent with design value calculation
  - A weight-of-evidence approach to significant contribution or interference determination
  - Updates to the modeling platform
- The TCEQ's modeling and analysis concluded that emissions from Texas do not contribute significantly to nonattainment or interfere with maintenance of the 2015 eight-hour ozone NAAQS in another state.

Relationship between Texas and EPA Transport Frameworks



Key Differences Between Texas and EPA Transport Modeling Approaches

#	Change	Texas	EPA (Jan 6, 2017 NODA)	Rationale[1]
1.	Base Year	2012	2011	2011 is not a representative year for ozone formation for Texas and surrounding states due to extreme drought. In addition the use of more recent data is desirable.
2.	Baseline Design Value used in Identification of Maintenance Monitors	The most recent of the three design values that include the base year	Maximum of the three design values that include the base year	The methodology used by the EPA does not account for declining emissions trends. *(Emissions have been declining due to control of major stationary sources, shutdowns, mobile fleet turnover, etc.)*
3.	Contribution Calculation	Days/grid cells used for contribution calculation aligned with those used in future design value calculation	Days/grid cells used for contribution calculation **NOT** aligned with those used in future design value calculation	Using different days/grid cells for future design value calculation and contribution calculation ignores the variability in modeled concentrations on different days/grid cells.
4.	Future Year Boundary Conditions	Derived from a Future Year GEOS-Chem simulation	Same as Base Year	Using Base-Year boundary conditions ignores the impact of changing international emissions on monitors.
5.	Electric Generating Unit (EGU) Projections	Eastern Regional Technical Advisory Committee (ERTAC) EGU Forecasting Tool with 2012 base year	Integrated Planning Model (IPM) projections	The IPM projections included projected impacts of the Clean Power Plan and unverifiable changes in the generation fleet.

[1] Comments outlining these arguments were submitted in response to the following EPA actions:

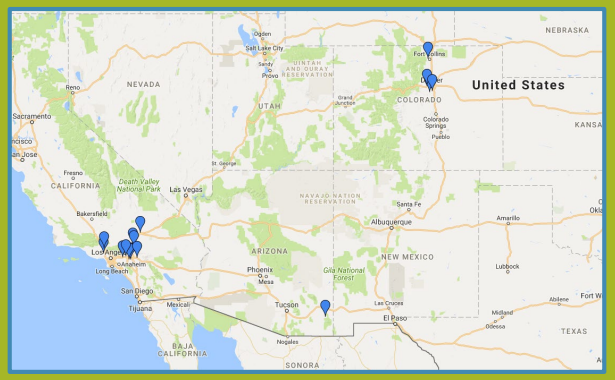
Preliminary Interstate Ozone Transport Modeling Data for 2015 Ozone NAAQS (submitted 4/5/17);

Notice of Data Availability of the Updated Ozone Transport Modeling Data for the 2008 Ozone NAAQS (submitted 10/15/15);

Notice of Availability of the EPA's 2018 Modeling Platform (submitted 6/24/14); and

Notice of Availability of the EPA's 2011 Modeling Platform (submitted 3/31/14).

Monitors Tagged For Further Review in Screening Step



AQS ID	Site Name	State	County	2023 DV_F[1] (ppb)	2023 MDV_F[2] (ppb)	2023 $TXDV_F$[3] (ppb)
80350004	Chatfield State Park	Colorado	Douglas	73	72	1.42
80590006	Rocky Flats	Colorado	Jefferson	72	73	1.26
80590011	National Renewable Energy Labs-NREL	Colorado	Jefferson	71	71	1.26
80690011	Fort Collins-West	Colorado	Larimer	72	71	1.22
80050002	Highland Reservoir	Colorado	Arapahoe	70	71	1.15
40038001	Chiricahua National Monument	Arizona	Cochise	71	69	1.06
60371201	Reseda	California	Los Angeles	80	78	0.76
60371701	Pomona	California	Los Angeles	80	82	0.72
60376012	Santa Clarita	California	Los Angeles	87	86	0.9
60658001	Rubidoux	California	Riverside	88	85	0.73
60658005	Mira Loma (Van Buren)	California	Riverside	84	83	0.71
60710001	Barstow	California	San Bernardino	71	72	0.84
60710306	Victorville-Park Avenue	California	San Bernardino	76	77	0.81
60711004	Upland	California	San Bernardino	91	90	0.88
60714001	Hesperia-Olive Street	California	San Bernardino	82	79	0.86
60714003	Redlands	California	San Bernardino	94	91	0.74

[1] *2023 DV_F is the modeled 2023 design value and used to identify monitors with nonattainment issues in 2023.*
[2] *2023 MDV_F is the modeled 2023 Maintenance Future Year Design Values calculated by multiplying the Relative Response Factor (RRF) by the most recent regulatory design value that contains 2012 (the modeling base year) and is used to identify monitors with maintenance issues in 2023.*
[3] *$TXDV_F$ is the contribution from Texas emissions to the 2023 DV_F at downwind monitors.*

Weight-of-Evidence Analysis to Determine Significant Contribution or Interference with Maintenance

Colorado Monitors

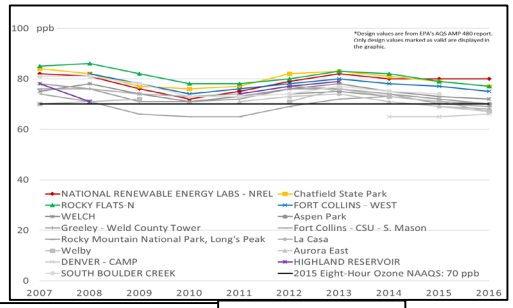
- Eight-hour ozone design value trends
- Monitored elevated ozone days
- Back trajectory analysis on elevated ozone days
- Texas contributions on projected future-year elevated ozone days
- Collective interstate contribution to future design value
- Direct Decoupled Method (DDM) and analysis of MDA8 Ozone responsiveness to Texas emissions

California Monitors

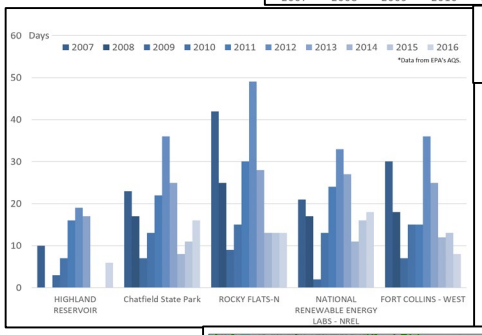
- Conceptual model of eight-hour ozone formation
- Eight-hour ozone design value trends
- Monitored elevated ozone days
- Back trajectory analysis on elevated ozone days
- Texas contributions on projected future-year elevated ozone days
- Collective interstate contribution to future design value

➢ Since the Arizona monitor has never been designated a nonattainment monitor (for the 1997 and 2008 eight-hour ozone standards) and is currently attaining the 2015 eight-hour ozone standard, no further analysis was conducted.

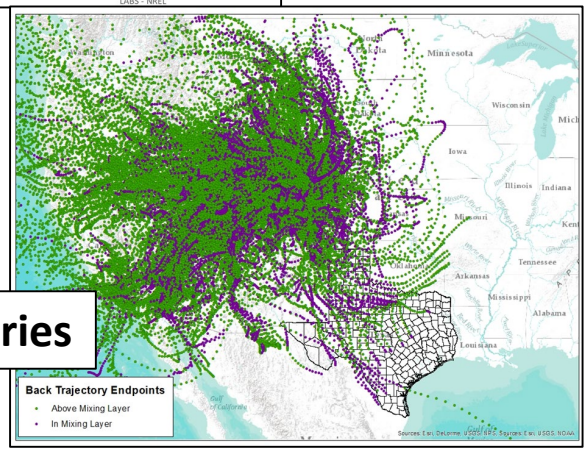
Colorado Weight-of-Evidence Analysis



Trends



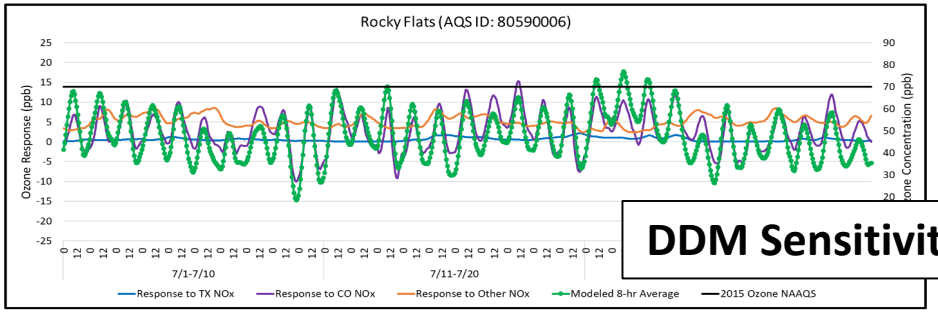
Trajectories



Site Name	AQS ID	Number of Future Elevated Days	Average Texas Contribution on Future Elevated Ozone Days (ppb)	Average MDA8 on Future Elevated Ozone Days (ppb)	Percentage of Texas Contribution in MDA8
Chatfield State Park	80350004	9	0.77	73.05	1.06%
Rocky Flats	80590006	10	0.89	73.64	1.21%
National Renewable Energy Labs-NREL	80590011	11	0.86	74.09	1.16%
Fort Collins-West	80690011	2	0.56	73.06	0.77%
Highland Reservoir	80050002	8	0.52	73.80	0.71%

Contribution Analysis

AQS ID	Percentage of 2023 DV_F from Background Contribution	Percentage of 2023 DV_F from Collective Interstate Contribution	Percentage of 2023 DV_F from Intra-State Contribution
80350004	62.12%	9.86%	25.44
80590006	60.57%	10.21%	26.88
80590011	60.33%	10.27%	27.04
80690011	67.42%	9.32%	20.88
80050002	62.47%	9.88%	25.28



DDM Sensitivity

Conclusion

- Texas conducted modeling and analysis that, though different from the EPA's modeling and analysis, is within the CSAPR framework and allowed flexibilities[1], follows sound scientific principles, and is in line with the EPA's Modeling Guidance[2].
- Among monitors projected to be in nonattainment or have maintenance issues in 2023, 16 monitors were tagged for further review, one in Arizona, 10 in California, and five in Colorado.
- A weight-of-evidence approach that examined several factors (such as design value trends, back trajectory analysis, total interstate contributions, DDM, etc.) was used to conclude that Texas does not contribute significantly to nonattainment or interfere with maintenance of the 2015 eight-hour ozone NAAQS at any downwind monitors.

[1]EPA's 2018 Memo "*Information on the Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I)*"
[2]EPA's 2014 "*Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze*"

Additional Information

Texas 2015 Ozone NAAQS Transport SIP Modeling Webpage:

https://www.tceq.texas.gov/airquality/airmod/data/gn/

Texas Transport SIP Revision Documentation:

https://www.tceq.texas.gov/assets/public/implementation/air/sip/ozone/infrastructure/2015Ozone_Inf-Transport/17039SIP_2015OzoneTransport_pro_Backup.pdf

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