Memorandum

CITY OF DALLAS

DATE May 20, 2016

TO Honorable Members of the Quality of Life & Environment Committee:
Sandy Greyson (Chair),Tiffinni A. Young (Vice-Chair), Mark Clayton, Philip T. Kingston, B. Adam McGough, Rickey D. Callahan

SUBJECT Consideration of a Resolution Regarding the Proposed State Implemental Plan for DFW Ozone Pollution

On Monday, May 23, 2016, the Quality of Life & Environmental Committee will be briefed on the Air Quality Resolution. The briefing materials are attached for your review.

Please feel free to contact me if you have questions or need additional information.

Jill A. Jordan, P.E.
Assistant City Manager

Attachment

c: Honorable Mayor and Members of the City Council
A.C. Gonzalez, City Manager
Christopher D. Bowers, Interim City Attorney
Craig D. Kinton, City Auditor
Rosa A. Rios, City Secretary
Daniel F. Solis, Administrative Judge
Ryan S. Evans, First Assistant City Manager
Eric D. Campbell, Assistant City Manager
Mark McDaniel, Assistant City Manager
Joey Zapata, Assistant City Manager
Jeanne Chipperfield, Chief Financial Officer
Sana Syed, Public Information Officer
Elsa Cantu, Assistant to the City Manager – Mayor & Council

Consideration of a Resolution Regarding the Proposed State Implementation Plan for DFW Ozone Pollution

Quality of Life and Environment Committee
Dallas City Council

May 23, 2016

Office of Environmental Quality

Purpose

- Describe causes and impacts of ozone
- Explain current ozone regulatory situation for D-FW Region
- Consequences of failure
- Describe air quality resolution for consideration by QOLE today
- Request passage to full City Council for adoption

Causes and Impacts of Ozone

- Ozone forms when nitrogen oxides (NOx) and volatile organic compounds (VOC) are mixed in sunlight
  - Forms ozone leading to unhealthy breathing conditions and Ozone Action Days
- Ozone is known to be detrimental to human health, either exacerbating or leading to premature death from:
  - Asthma
  - Chronic Obstructive Pulmonary Disease
  - Other pulmonary and cardiac issues

Current Situation for D-FW Region

- Current standard for ozone is 75 parts per billion (ppb)

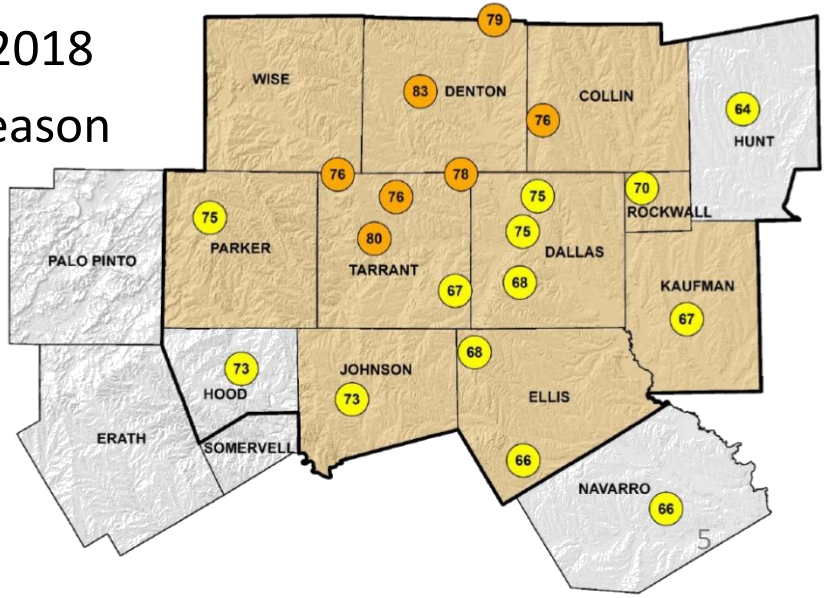
- D-FW Region is above the standard for ozone
  - 2015 Ozone Season average was 83 ppb
  - D-FW Region remains in “non-attainment”

- EPA deadline for ozone to be at or below 75 ppb is July 20, 2018

Monitoring Ozone

- Ozone in D-FW is measured by 20 air quality monitors located around D-FW

- TCEQ (Texas Commission on Environmental Quality) has a draft SIP (State Implementation Plan) to meet the 75 ppb standard
  - Actions designed to reduce ozone by 2018
  - Based on data from the 2017 ozone season



EPA Comments on Draft SIP

- Commends efforts in proposed SIP for addressing mobile sources
- States that more emission reductions are needed from stationary sources to meet the standard
- States that modeling overestimates the amount of ozone reduction

Consequences

Should EPA decide the final SIP is inadequate:

- Conditional approval of SIP
  - 1 year deadline to correct
- Limited approval of SIP
  - Includes sanctions
- Implementation of Federal Implementation Plan (FIP)
- Economic consequences
  - Loss of federal highway funds
  - Denied air permits for new businesses
  - Limitations on existing business expansion

Consequences (continued)

Should TCEQ's SIP fail to reduce ozone:

- Air quality will continue to fail to meet standard
- Health will continue to be impacted
- Economic vitality may suffer

Health Impacts

- Immediate health impacts include:
  - Shortness of breath, wheezing and coughing
  - Asthma attacks
  - Increased risk of respiratory infections
  - Increased susceptibility to pulmonary inflammation
- Long-term health impacts include:
  - Increased and/or prolonged hospitalization for people with lung diseases, like asthma, emphysema, or COPD
  - Higher risk of death
  - Lower birth weight and decreased lung function in newborns

Proposed Resolution

- Given the severity of the consequences and EPA's evaluation of the draft document, a stronger SIP is needed.
- The proposal is to send a Council resolution to this effect to TCEQ.
- Key points of the draft resolution are explained in the following slides.

Stationary Sources of Ozone Forming Emissions in D-FW

Scientists determined in 2004 that stationary sources of NOx outside of D-FW contribute to ozone non-attainment in D-FW.

- "Dallas-Ft. Worth Transport Project", ENVIRON International Corporation for Houston Advanced Research Center, funded by the Texas Environmental Research Consortium, April 2004

Stationary Sources (continued)

Recently, scientists have determined three types of significant stationary sources that contribute to the ozone in the region:

- Cement kiln operations (south and southeast of Dallas)[1]
- Barnett Shale production operations (southwest, west, northwest of Dallas)[1,2]
- Coal-fired power plants (south and east of Dallas)[1]

1) Dr. Kuruvilla John of the University of North Texas (UNT)
2) Dr. Jay Olaguer of the Houston Advanced Research Center (HARC)

Three Stationary Sources

1. Cement Plant Operations

- Three plants in Midlothian, TX, Ellis County
- Represent the largest concentration of cement manufacturing capacity in the U.S.
- NOx sources

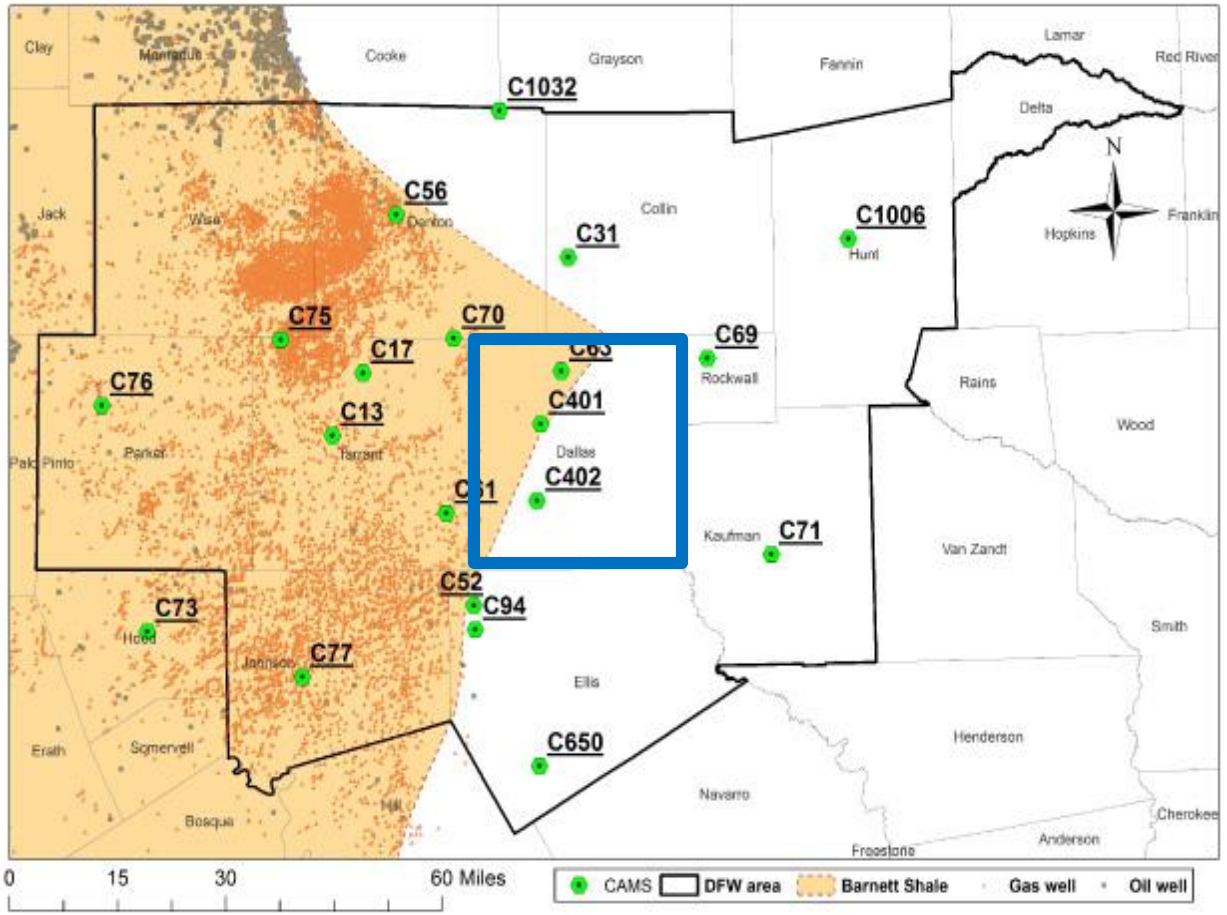
Three Stationary Sources (continued)

2. Barnett Shale Natural Gas Production Area

- Cooke, Dallas, Denton, Ellis, Erath, Hill, Hood, Jack, Johnson, Montague, Palo Pinto, Parker, Somervell, Tarrant, and Wise counties
  - Eight counties are outside D-FW non-attainment area
- Natural gas compressor stations, and other equipment related to natural gas production
- NOx and VOC sources

Three Stationary Sources (continued)

Barnett Shale Gas/Oil Wells and Air Monitors



Dallas County

From DFW Ozone Study, http://dfwozonestudy.org

Three Stationary Sources (continued)

Barnett Shale Area

- Given the level of gas production in the Barnett Shale, City of Dallas requests TCEQ to re-evaluate the impact on air quality from the stationary sources associated with gas production.

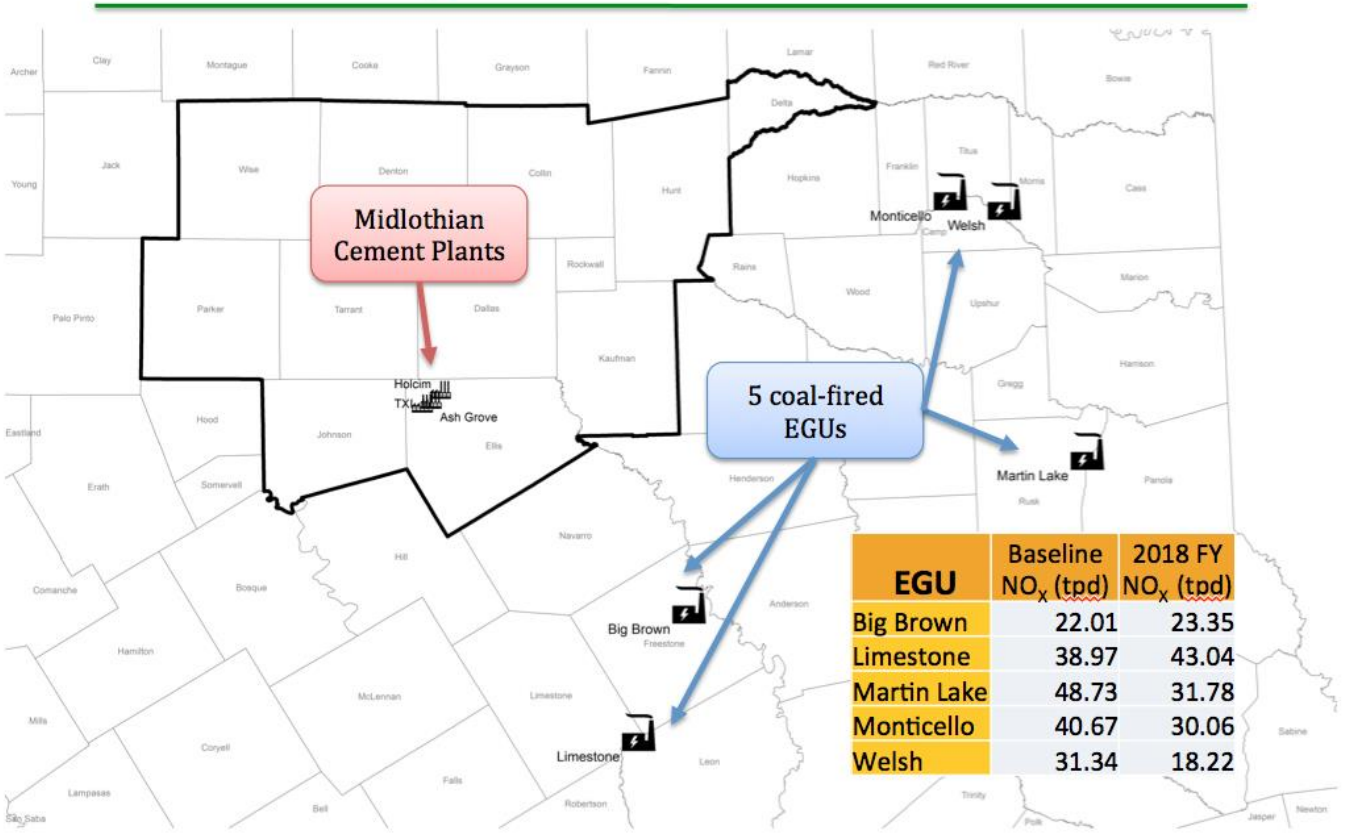
Three Stationary Sources (continued)

3. Coal-Fired Electric Power Plants

- Five plants located south, southeast, and east of the D-FW Region
- Potential NOx emissions of 22 to 48 tons per day per plant

Stationary NOx Sources Affecting D-FW Air Quality

Major Point Sources



EGU	Baseline NO_x (tpd)	2018 FY NO_x (tpd)
Big Brown	22.01	23.35
Limestone	38.97	43.04
Martin Lake	48.73	31.78
Monticello	40.67	30.06
Welsh	31.34	18.22

From DFW Ozone Study, http://dfwozonestudy.org

Potential Solutions

- Reduce emissions from stationary sources
  - Require electrification of compressors in Barnett Shale
  - Require additional air pollution controls on cement kilns and coal-fired power plants
- Promote renewable energy
- Require net metering and encourage eco-districts/district energy
- Implement EPA's Clean Power Plan

Proposed Air Quality Resolution

- Request TCEQ to develop stronger SIP
  - Accelerated measures
  - Address external stationary sources
- Request regional collaboration with EPA and TCEQ
- Encourage renewable energy development
  - Require net-metering
  - Develop eco-districts/district-energy
  - Promote renewable energy production
- Support Clean Power Plan

Conclusion

- Clean air benefits Dallas
  - Increases economic opportunity
  - Improves public health
- Request QOLE send the Air Quality Resolution to the full City Council for adoption

Appendices

Renewable Energy Creates Jobs

- Texas is #2 in the nation in renewable energy jobs
- As of 2012, 28,000 workers in Texas work in the renewable energy field*
  - Projected to add 6,000 jobs per year through 2020
  - Average income: $78,257
- Renewable energy reduces ozone in Texas and D-FW Region
- State should strive to be #1 in the nation

*_The Texas Renewable Energy Industry_, 2014 Report, Texas Wide Open For Business

Clean Air Benefits at Very Low Cost

From 1990 to 2010 there was a 26 to 1 **benefits to cost ratio*** for public health benefits as a result of the Clean Air Act

- $1.3 trillion in public health benefits from the Clean Air Act at a cost of $50 billion

** The Benefits and Costs of the Clean Air Act from 1990 to 2020, EPA, 2011*

SIP Development

- Safe ozone levels are established by the Clean Air Act (CAA) – federal law
- The "building blocks" of ozone (NOx and VOCs) are regulated by the Texas Commission on Environmental Quality (TCEQ) via a State Implementation Plan (SIP)
- North Central Texas Council of Governments (NCTCOG) reviews the SIP during comment period
- U.S. Environmental Protection Agency (EPA) approves TCEQ's SIP
- NCTCOG implements the elements of the SIP related to transportation for the D-FW Region

EPA Comments*

"We applaud the State for the Texas Emission Reduction Program (TERP) and the reductions achieved by such."

"We appreciate the number and variety of projects coordinated through the DFW area governments and the North Central Texas Council of Governments that will reduce emissions from mobile sources."

"Without additional emission reduction measures, we don't see how the area will meet the standard of 75ppb by the end of the 2017 ozone season."

"Our overall evaluation ……indicates that the modeling is overestimating the amount of ozone reduction ……and this is leading to modeling projections in 2017 that are unrealistic."

"The TCEQ's long-term trends analysis ….indicates … a rate of 1.1 parts per billion (ppb) [reduction] per year."

"…we are not convinced that the area can achieve what amounts to an average of 4 ppb per year in emission reductions over the next two ozone seasons without additional emission reduction measures."

"Therefore, it is unlikely the model projections of an additional 8 ppb reduction between 2015 and 2017 can be achieved without additional reductions."

"…we estimate that additional NO_X reductions on the order of 100-200 tons per day in the local area or a combination of local and larger upwind reductions are needed to achieve an 8 ppb drop in 2 years."

"Without emission reductions on this scale, it is unlikely that the area will attain by the attainment date."

*Letter to TCEQ, January 2016

SIP vs FIP

- **State Implementation Plans (SIP)** is a state plan for the establishment, regulation, and enforcement of air pollutant standards established and approved by EPA.

- **Federal Implementation Plan** (FIP) is a federally implemented plan to achieve attainment of air quality standards and is used when a state is unable to develop an adequate plan.

D-FW Ozone Studies

- Conducted by Dr. Kuruvilla John and Mahdi Ahmadi at the University of North Texas
- Funded by *Downwinders at Risk*
- “The North Texas Ozone Attainment Initiative Project” report online at http://dfwozonestudy.org
- “Using UNT's supercomputers, and assisted by staff from the Texas Commission on Environmental Quality, Dr. John was able to replicate the state's computer model being used to design a new DFW clean air plan”
- Modeled what the ozone concentrations would be in the D-FW Region if the three cement plants in Midlothian, TX had 90% NOx removal using pollution control equipment
- Modeled what the ozone concentrations would be in the D-FW Region if the five coal-fired power plants (Big Brown, Limestone, Monticello, Welsh, and Martin Lake) east and southeast of the region had 90% NOx removal using pollution control equipment

Cement Kiln & Coal-Fired Power Plant Operations

Some studies show that cement kiln and coal-fired power plant emissions play a significant role in the region's ozone levels while admitting more research is needed.

- Dr. Kuruvilla John of UNT, using UNT's supercomputers and assisted by staff from the Texas Commission on Environmental Quality, was able to replicate the state's computer model being used to design a new D-FW clean air plan
- Dr. John modeled what the ozone concentrations would be in the D-FW Region if the three cement plants in Midlothian, TX and the five coal-fired power plants (Big Brown, Limestone, Monticello, Welsh, and Martin Lake) east and southeast of the region had 90% NOx removal using pollution control equipment
- Conclusion: a decrease in ozone would be achieved at the air monitors by an estimated 3.4 to 6.5 ppb

Potential Stationary Sources

- “Dallas-Ft. Worth Transport Project”, ENVIRON International Corporation for Houston Advanced Research Center, funded by the Texas Environmental Research Consortium, April 2004
- Determined: that stationary NOx sources located in the D-FW area contributed to ozone nonattainment in D-FW

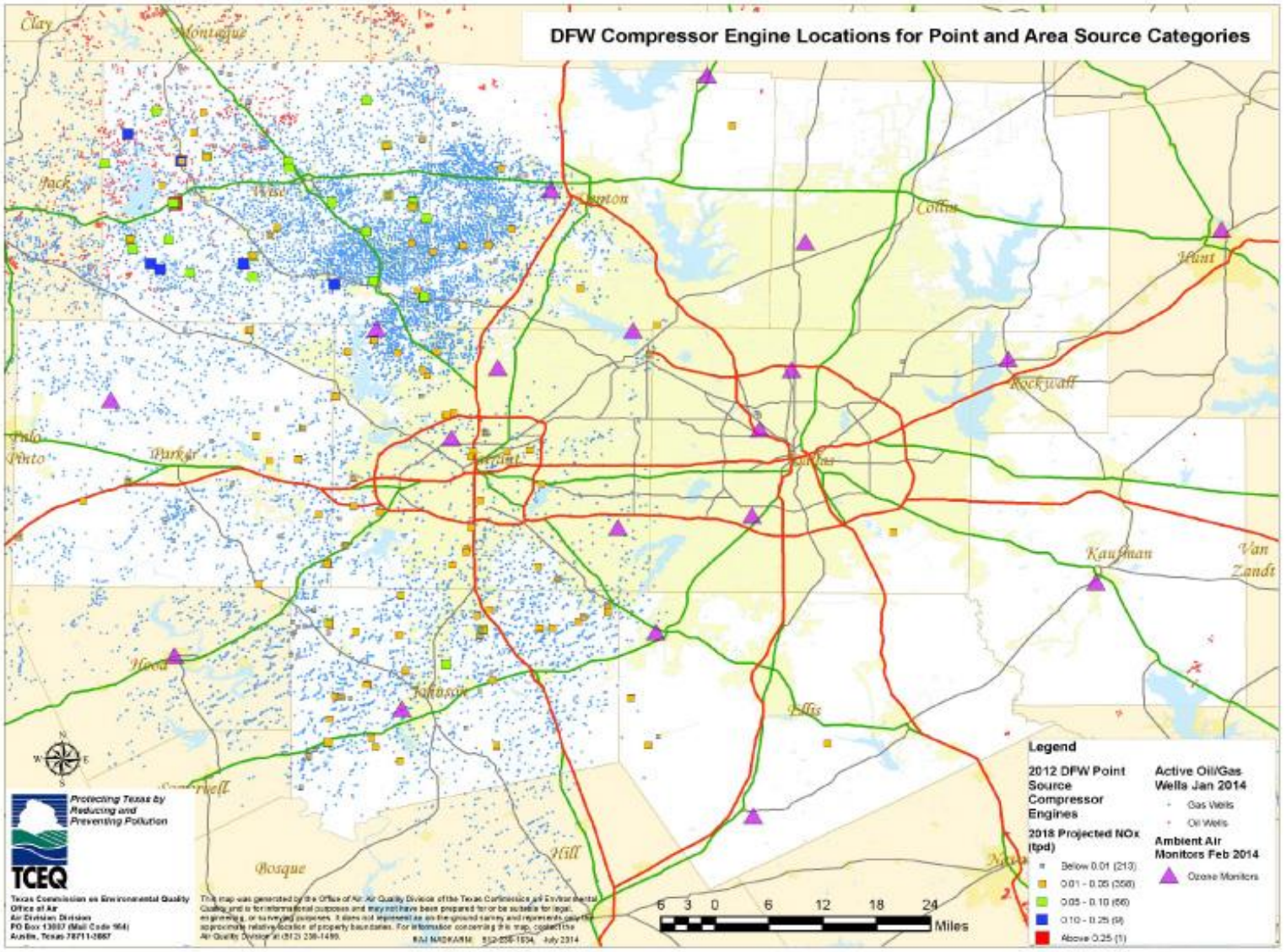
Potential Stationary Sources – Barnett Shale Area

- Jay Olaguer of the Houston Advanced Research Center (HARC) created a model that predicted that ozone forms downwind of simulated natural gas compressor facilities and flares
- “Flares and compressor engines used in natural gas operations… are large sources of …NOx…”
- “The Potential Near-Source Ozone Impacts of Upstream Oil and Gas Industry Emissions”, Aug 2012

Potential Stationary Sources – Barnett Shale Area

- Dr. Kuruvilla John of UNT concluded that “the winds blowing from areas with high shale gas activities contributed to higher ozone downwind” after studying 14 years of air monitor data from the D-FW air monitors
- “Statistical Evaluation of the Impact of Shale Gas Activities on Ozone Pollution in North Texas”, Dec 2015

Compressor Stations & Air Monitors



From DFW Ozone Study, http://dfwozonestudy.org

Promote Net-Metering

Net-metering allows residential and commercial customers who generate their own electricity to sell excess energy back to the grid at a fair rate.

- **Texas does not currently require net-metering to support these citizens.**
- Many states have passed net-metering laws.
- In other states, utilities may offer net-metering programs voluntarily or as a result of regulatory decisions.
- Differences between states' legislation and implementation mean that the benefits of net-metering can vary widely for solar and wind customers in different areas of the country.

Promote Net-Metering (continued)

- Energy production may be intermittent (sometimes the wind does not blow and clouds make solar less efficient) and sometimes the power is not consumed as it is being generated. Net metering allows small generators to receive full value for the electricity they produce without installing expensive battery storage systems. **This is important because it directly affects the economics and pay-back period for the investment.**
- Net-metering reduces the installation costs for the customer by eliminating the need for a second energy meter.
- Net metering provides a simple, inexpensive, and easily-administered mechanism for encouraging the use of small-scale energy systems, which provide important local, national, and global benefits to the environment and the economy.

Develop Eco-district/District-energy

- Eco-district/District-energy:
  - Creates “micro-grids” at the neighborhood or community level
  - Renewable-energy generators (people with solar panels or wind-turbines on their property) can tie the systems together to:
    - Share energy (if it’s cloudy one day while windy or vice versa)
    - Negotiate a “buy-back” rate for the energy produced
    - Create energy security should the grid go down either from over-demand or from unforeseen disasters
  - District-energy fits into a larger “eco-district” model that also incorporates “complete streets”, “food systems”, “green infrastructure”, and other localized benefits

WHEREAS, the Dallas-Fort Worth Region has been in continual violation of the federal Clean Air Act standard for ozone since 1991 and the region has until July 20, 2018 to meet the ozone air quality standard of 75 parts per billion (ppb); and,

WHEREAS, the U.S. Environmental Protection Agency (EPA) has officially stated that the latest air quality State Implementation Plan (SIP) proposed by the Texas Commission on Environmental Quality (TCEQ) is not adequate to address the ozone concentrations "without additional reductions" in ozone-forming pollution and that the proposed SIP is using "unrealistic" modeling projections; and,

WHEREAS, studies have shown a direct correlation between health issues, such as asthma and chronic obstructive pulmonary disease, and higher levels of ozone; and,

WHEREAS, the economic success of the D-FW Region is closely tied to the environmental quality and living conditions of the area; and,

WHEREAS, the proposed SIP fails to adequately address emissions from stationary sources such as cement kilns, coal-fired power plants, and compressors and other equipment related to the Barnett Shale gas production area; and,

WHEREAS, independent studies have concluded that reductions of nitrogen oxides from stationary sources such as cement kilns and coal-fired power plants outside the D-FW region, and reductions of volatile organic compounds (VOCs) from compressor emissions in the Barnett Shale gas production areas, can reduce ozone levels in the D-FW Region. Such control measures as Selective Catalyst Reduction at kilns and coal plants and electrification of compressors would help the region meet or exceed the current ozone standard of 75 ppb at all North Texas air monitors; and,

WHEREAS, ozone can be reduced by the generation of electricity from renewable energy sources, such as solar, wind, geothermal, and co-generation which can be elements of a distributed energy district; and,

WHEREAS, the State of Texas could increase its support of the renewable energy sector through net-metering requirements and distributed energy districts.

Now, Therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF DALLAS:

SECTION 1. The City of Dallas concurs with the EPA's comments on the proposed SIP and requests that the TCEQ revise the proposed SIP to add additional measures to the clean air plan that will reduce ozone levels at an accelerated rate;

SECTION 2. The City of Dallas requests the TCEQ reduce emissions from stationary sources in Texas to reduce transport of these emissions to the D-FW Region to reduce ozone levels in this region;

SECTION 3. The City of Dallas requests the TCEQ and the EPA have a cooperative dialogue with the City of Dallas to develop practical and effective solutions at the local, state, and federal level to reduce ozone levels in the D-FW Region;

SECTION 4. The City of Dallas encourages state agencies to explore changes promoting net-metering and the creation of distributed energy districts and the creation of additional programs to expand the use of solar power and other renewable energy sources in the state;

SECTION 5. The City of Dallas supports the EPA's Clean Power Plan because implementation of this plan could help decrease ozone levels in Dallas and encourages the State of Texas to reverse its position and support the Clean Power Plan.