Department of Environment & Conservation

Presented to:

Environmental Show of the South
Gatlinburg, Tennessee

April 21, 2016

Presentation Outline

- The NAAQS Criteria Pollutant Process
  - Ozone
  - $PM_{2.5}$ & PM_{10}
  - Sulfur Dioxide
  - Nitrogen Dioxide
  - Lead
  - Carbon Monoxide

Presentation Outline - Continued

- Other TDEC-APC Matters
  - Permit Streamlining Efforts
  - Clean Power Plan
  - Mobile Source Fuels
  - Startup, Shutdown, and Malfunctions
  - Small Business Environmental Assistance Program

NAAQS CYCLE

EPA reviews and, if necessary, revises NAAQS every 5 years

(PM, O_3, SO_2, NO_2, Pb, CO)

State submits designation recommendations based on monitoring/modeling data one year after NAAQS is revised

EPA issues designations (nonattainment, attainment, or unclassifiable) two years* after NAAQS is revised

* 3 years if additional information needed

State/Local submits Attainment Plan*** for nonattainment areas within three years after designation

***not required for marginal ozone NAA's

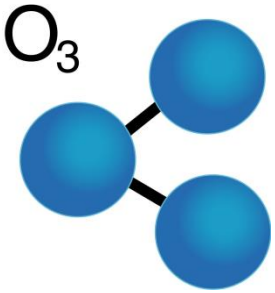
Attainment deadline five or more years** after designation per Clean Air Act

** 3 years for marginal ozone NAA's, up to 20 for extreme ozone NAA's

Once nonattainment area meets standard, State/Local submits Maintenance Plan & Redesignation Request

EPA redesignates area to Attainment

Ozone



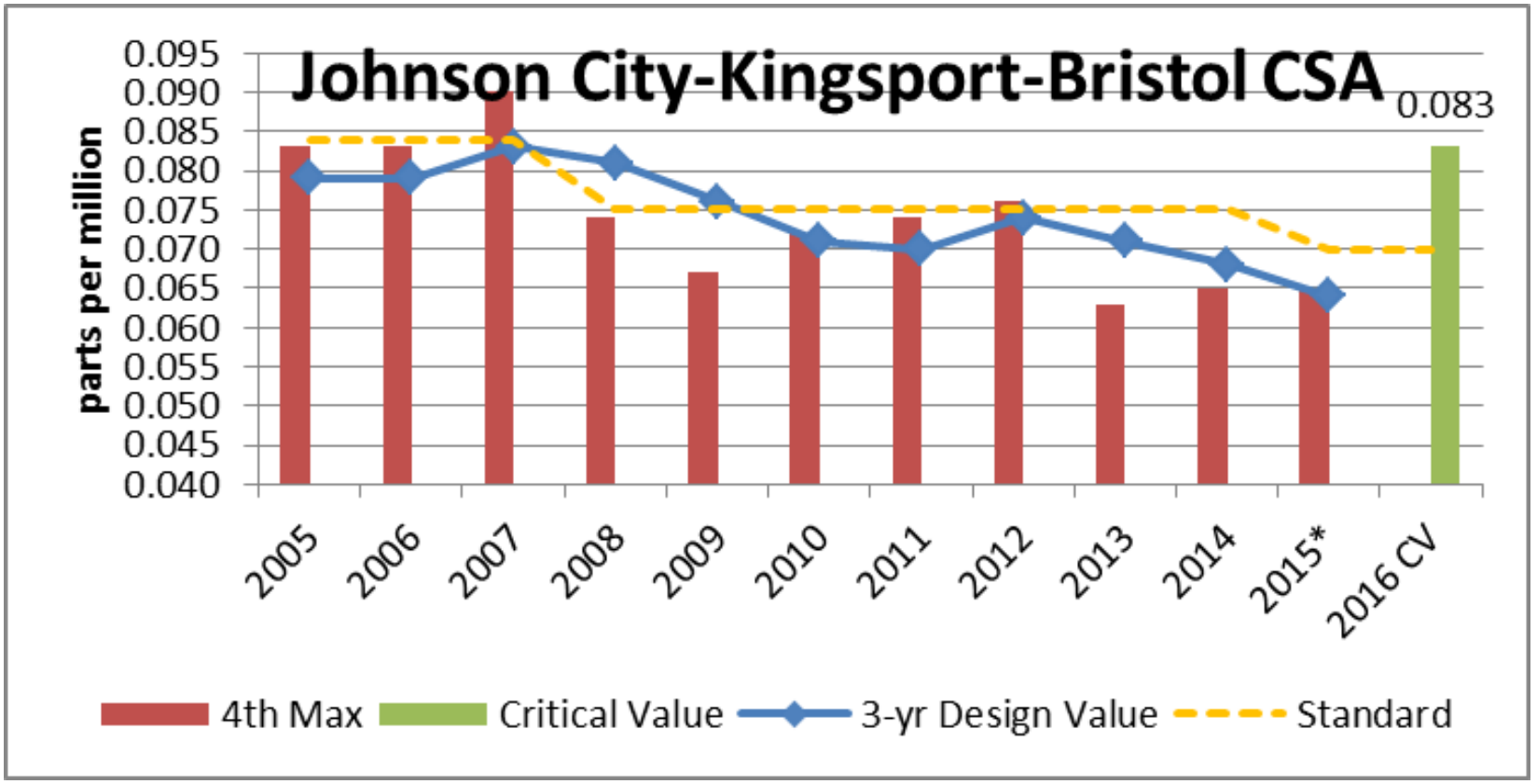
Colorless, odorless gas that is formed in the atmosphere as the result of man-made pollution and can trigger a variety of health problems including chest pain, coughing, throat irritation, and airway inflammation. It can reduce lung function and harm lung tissues and can worsen lung diseases such as bronchitis, emphysema, and asthma.

Current standard is bases on an 8-hour average and was set in 1997 at 84 ppb. Lowered to 75 ppb in 2008 and again to 70 ppb in 2015.

Implementing 2015 Ozone NAAQS

- Timeline:
  - Revised NAAQS Promulgated 10/1/2015
  - State recommendations of attainment areas will be due ~ October 2016 based upon 2013-2015 data.
    - TN should be able to recommend all areas of the state be designated as attainment
  - EPA final designations should occur October 2017
    - EPA will use 2014-2016 ozone data
  - State SIPs are due:
    - ~ October 2018 for the infrastructure SIP for entire state
    - ~ October 2020 for the attainment SIP for nonattainment areas (moderate and above)

Ozone Trends & Critical Values



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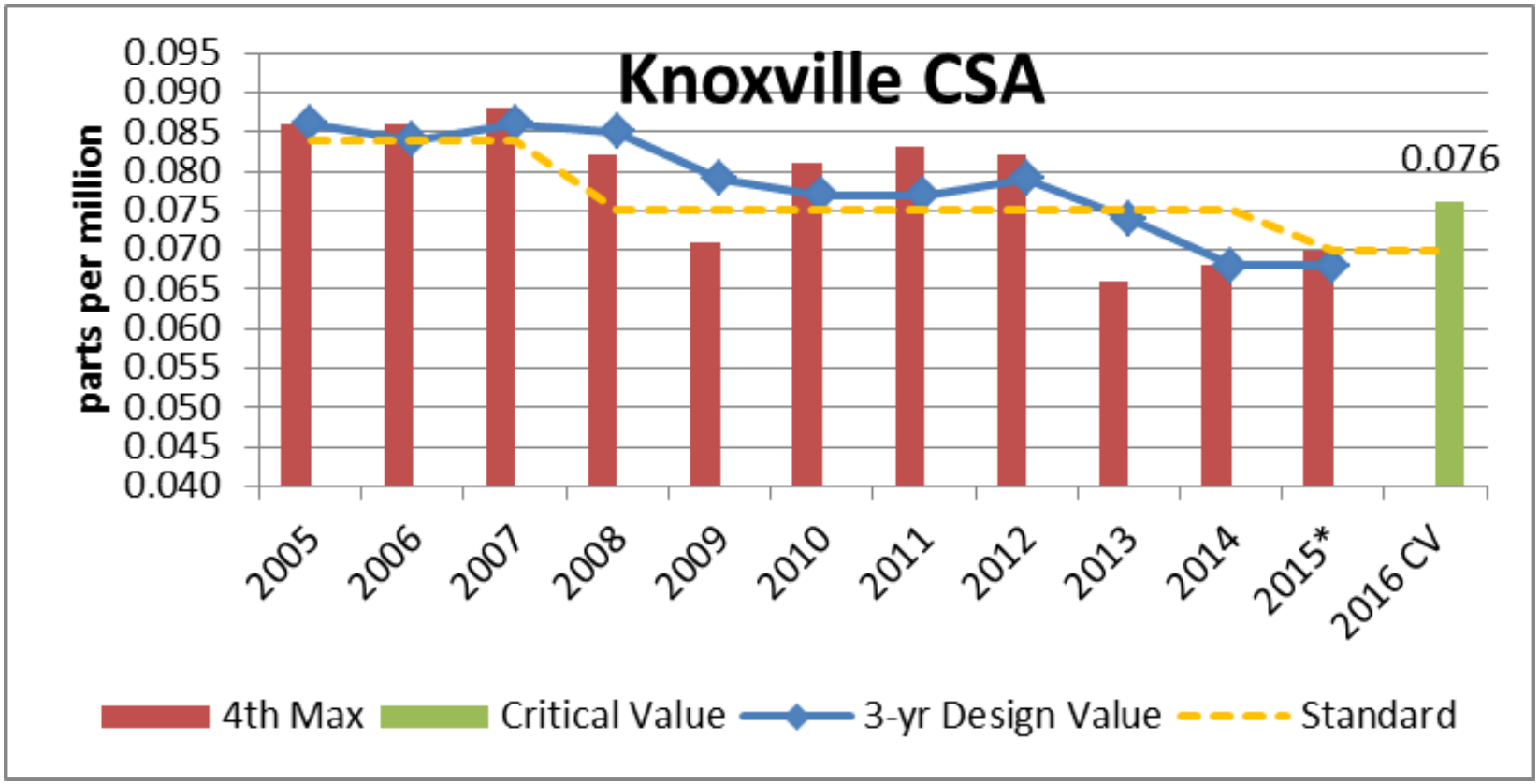

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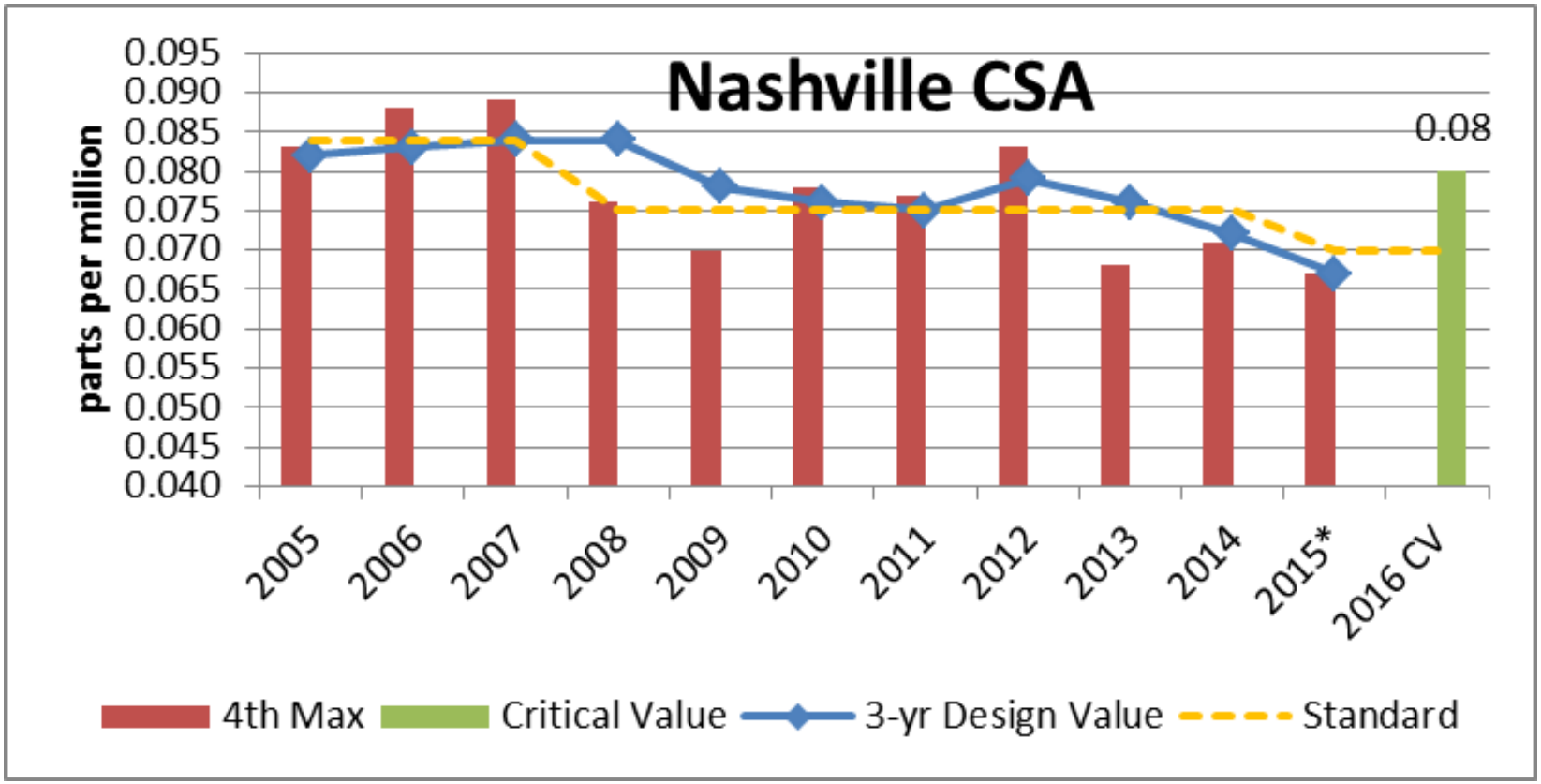

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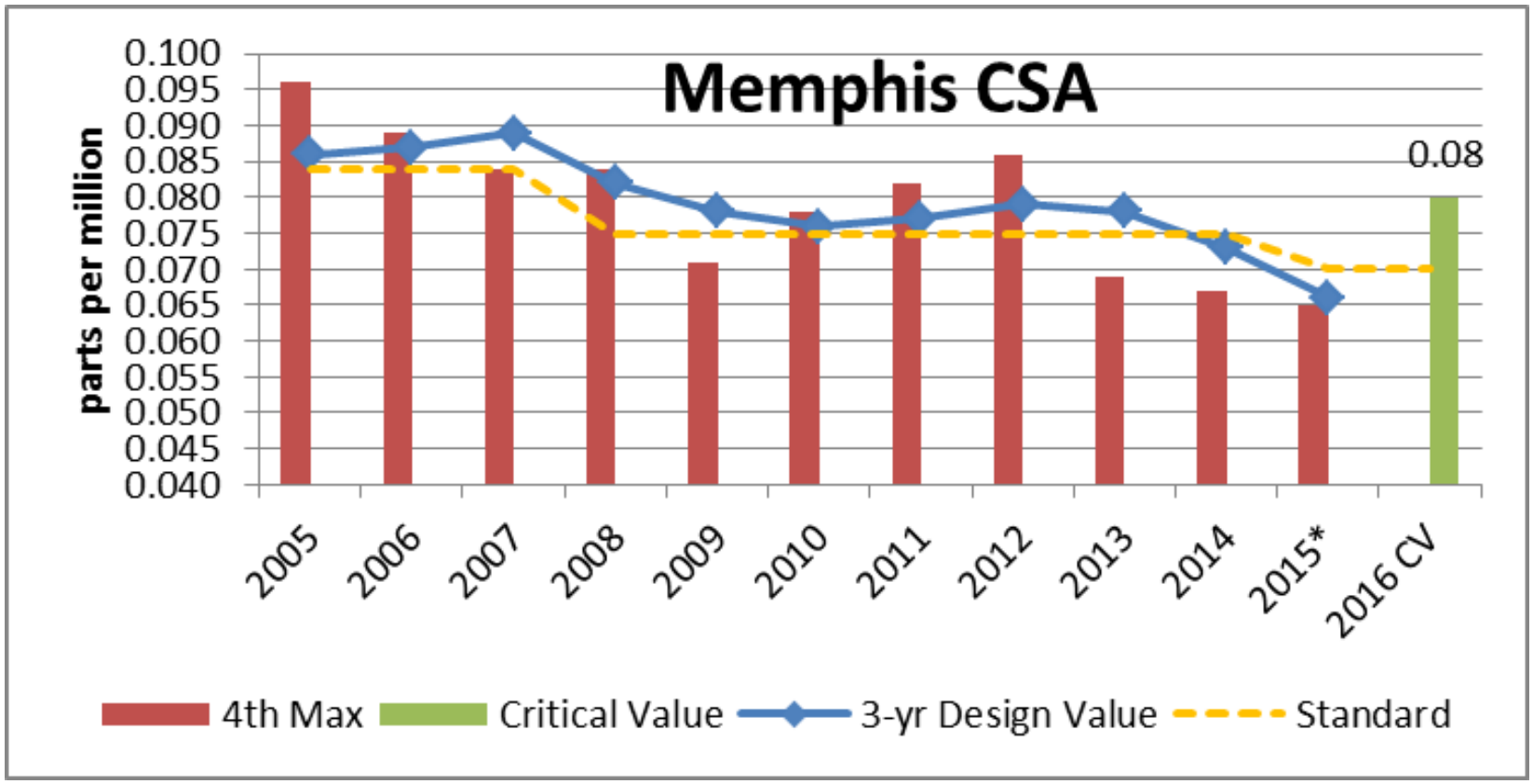


2008 Ozone Nonattainment Area Status - Memphis

- **Attained standard in 2014**
- **Shelby County Health Department prepared maintenance plan & redesignation request**
  - **TDEC Submitted to EPA on 1/14/2016**
- **Arkansas DEQ And Mississippi DEQ, submitted similar requests in late 2015**

$PM_{2.5}$

Overall, $PM_{2.5}$ levels in Tennessee have been improving.

There are two $PM_{2.5}$ NAAQS:

- Annual –
  - Initially 15.0 µg/m³ set in 1997
  - Lowered to 12.0 µg/m³ in 2012
- Daily –
  - Initially set at 65 set at µg/m3 in 1997
  - Lowered to 35 µg/m³ in 2006

$PM_{2.5}$ is primarily composed of sulfates, organic compounds and ammonia

PM2.5

Preliminary PM2.5 Design Value Status as of 2/7/2016

County	AQS ID	ADDRESS	Daily DV 2013 to 2015	Daily VI	Annual DV 2013 to 2015	Annual VI
Blount	470090011	2007 SEQUOYAH AVENUE MARYVILLE tn 37803	18	Y	8.6	Y
Davidson	470370023	105 SOUTH 17TH ST @ LOCKELAND SCHOOL	21	Y	10.1	Y
Davidson	470370036	400 DAVIDSON RD	19	Y	9.4	Y
Dyer	470450004	175-B GREENWAY STREET, DYERSBURG TN 38024	17	Y	8.5	Y
Hamilton	470650031	1517 TOMBRAS AVENUE, EAST RIDGE	19	N	9.1	N
Hamilton	470651011	SODDY DAISY H.S. 00618 SEQUOYAH RD	20	N	8.9	N
Hamilton	470654002	RIVERSIDE SUBSTATION 911 SISKIN DR	18	N	8.8	N
Knox	470930028	1000 FRANCIS ROAD	19	Y	9.2	Y
Knox	470931013	939 Stewart St. Knoxville, TN 37917	18	Y	10	Y
Knox	470931017	1613 VERMONT AVENUE	20	Y	10	Y
Knox	470931020	4625 MILDRED DRIVE	19	Y	9.1	Y
Lawrence	470990002	355 BUSBY RD	16	Y	7.8	Y
Loudon	471050108	130 WEBB DRIVE Loudon TN 37774	18	Y	9.4	Y
McMinn	471071002	SAINT MARK AME ZION CHURCH, 707 NORTH JACKSON ST. Athens TN 37303	17	Y	8.6	Y
Madison	471130006	1371-A NORTH PARKWAY JACKSON, TN 38301	17	Y	8.3	Y
Maury	471192007	1600 NASHVILLE HWY Columbia TN	16	Y	8	Y
Montgomery	471251009	1514-C GOLF CLUB LANE Clarksville TN 37040	20	Y	8.9	Y
Putnam	471410005	630 EAST 20TH STREET Cookeville TN 38501	18	Y	8.2	Y
Roane	471450004	HARRIMAN HIGH 1002 N. ROAN ST Harriman TN 37748	18	Y	8.7	Y
Shelby	471570047	1064 BREEDLOVE STREET (Roof of Guthrie Clinic)	19	N	9.2	N
Shelby	471570075	6388 Haley Rd. (Shelby Farms NCORE site)	18	N	8.6	N
Sullivan	471631007	1649 D STREET Kingsport TN 37664	15	Y	8.4	Y
Sumner	471650007	ROCKLAND RECREATION AREA-OLD HICKORY DAM Army Corp of Engineer Property	19	Y	9	Y

Notes:

1. Data available as of 2/7/2016.
2. In this table, all design values are calculated based on the rules specified in Appendix N for the 2012 PM2.5 NAAQS. These are "2 Yr" values only and a 3 Yr DV is required for standard comparisons.

A. Annual PM2.5 standard design values shall be rounded to the nearest 0.1 µg/m3 (decimals 0.05 and greater are rounded up to the next 0.1, and any decimal lower than 0.05 is rounded down to the nearest 0.1). The new annual standard is 12.0.

B. 24-hour PM2.5 standard design values shall be rounded to the nearest 1 µg/m3 (decimals 0.5 and greater are rounded up to the nearest whole number, and any decimal lower than 0.5 is rounded down to the nearest whole number). The 24 hour standard is 35.

1997 and 2006 $PM_{2.5}$ Nonattainment Area Status - Knoxville

- **Attained Standard in 2011**
- **Redesignation delayed due to laboratory issues**
- **Designation request planned for early-mid 2016**

PM 10

Preliminary 2013 to 2015 PM10 24 Hour DV

AQS ID	POC	Site Location	3 Yr Estimated Exceedances 2013 2015	Comments
470370002	1	LESTER & HART STS	**0**	
470370024	1	56TH AVE AND LOUISIANA ST	**0**	
470650006	1	3300 SOUTH BROAD STREET. 33RD AND BROAD, WDEF-TV	**0**	Incomplete 2015
470931013	1	1403 DAVANNA STREET Knoxville, Tn 37917	**0**	Incomplete 2015
471570016	1	GAS SERVICE CENTER MEAGHER STREET	**0**	Incomplete 2015
471570024	1	416 ALABAMA AVENUE	**0**	Incomplete 2015
471730107	1	DONAHUE PROPERTY ON DONAHUE ROAD	**0**	Incomplete 2015

PM10 24 Hour Avg. Annual Estimated Days > 150 ug/m3 as of 02/11/2016

Sulfur Dioxide (SO_2)

Sulfur Dioxide forms when sulfur bearing fossil fuels are combusted.

Sulfur Dioxide reacts with water to form sulfurous and sulfuric acid. Those acids can irritate sensitive mucous membranes and airways. Once in the body, they can react with body salts to form sulfates and sulfites.

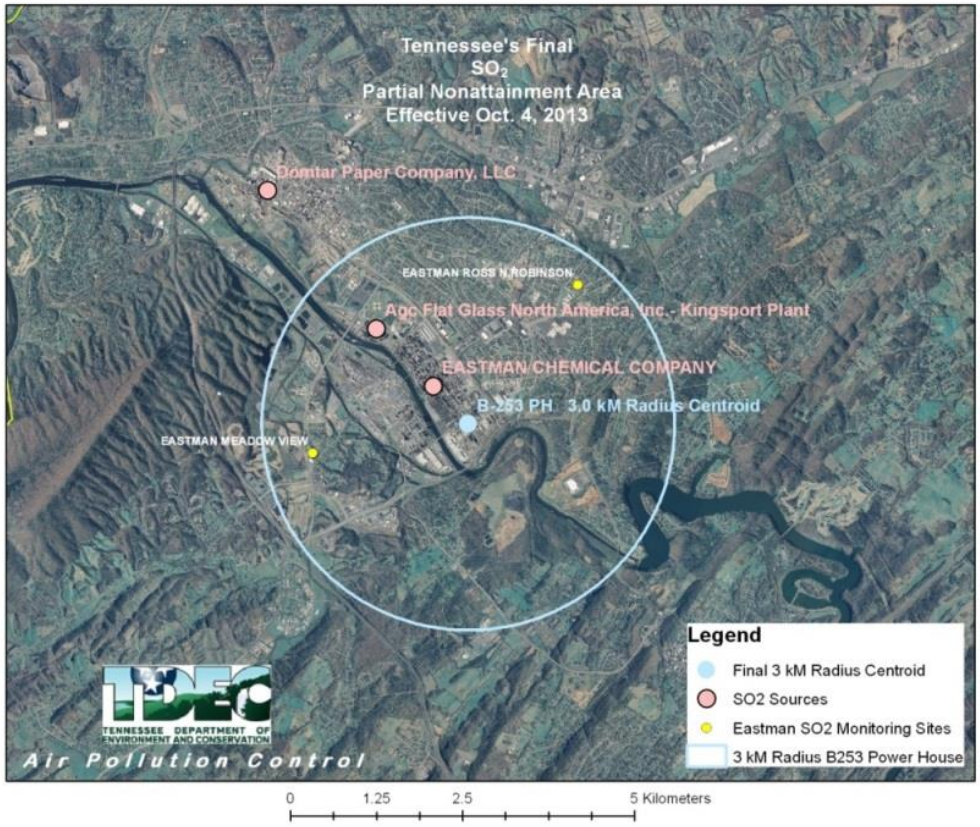
Sulfur Dioxide in the atmosphere can form acidic precipitation and sulfate fine particulate matter.

Sulfur Dioxide

- 6/22/2010 – US EPA Tightened SO_2 Standard
- Four Rounds of Designations
  - 1st round – 8/5/2013 (completed) in accordance with Clean Air Act
    - based on monitors with violating 2009-2011 design values
  - Rounds 2 through 4 set by EPA/Sierra Club Consent Decree
    - 2nd round - 7/2/2016
    - 3rd round – 12/31/2017
    - 4th round – 12/31/2020

Sulfur Dioxide - Round 1

- Based on Monitors with Violating 2009-2011 Design Value
- One Area in Tennessee
  - 3 km radius around Eastman Chemical, Kingsport
- Attainment Plan Due April 6, 2015
- Working with EPA and Eastman to Resolve Several Technical Issues
- 3/10/2016 - EPA issued Findings of Failure to submit to 13 states, including Tennessee



SO_2 Round 2 - TVA Gallatin Plant

- TVA has installed SO_2 controls on all four units at TVA Gallatin. Last set of controls began operation February 7, 2016.

SO_2 Round 3 (modeling) OR Round 4 (monitoring)

TVA Cumberland

TVA Johnsonville

TVA Allen

Sulfur Dioxide

Preliminary Sulfur Dioxide Data Evaluations

AQSID	County	Street Address	2013 to 2015 DV	Comment
470010101-1	Anderson	FREELS BEND_STUDY AREA	**6**	Incomplete
470090101-2	Blount	GREAT SMOKY MOUNTAINS NP LOOK ROCK	**3**	Incomplete
470370011-1	Davidson	1015 TRINITY LANE	**10**	Incomplete
471570075-1	Shelby	NCORE Site 6388 Haley Rd.	**9**	Incomplete

New (NAAQS) for sulfur dioxide 75 parts per billion (ppb), based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. Date evaluated 02/11/2016.

Nitrogen Dioxide NO_2

Can cause inflammation of airways and aggravate asthma

Forms when heat and pressure from combustion cause oxygen & nitrogen in the air to chemically combine. Once in the atmosphere, can combine with ammonia or other substances to form nitrate fine particles

Ambient exposures are greatest in urban areas near roadways. Nationally, about 16% of the population lives within 300 feet of roadways – primarily a mobile source issue

Very restrictive standard makes NSR permitting very difficult to do – even for small sources like emergency generators.

Nitrogen Dioxide

Preliminary Nitrogen Dioxide Data Evaluations

AQS ID	County	Location	2013 2015 NO2 DV	Comment
470370040	Davidson	1113 ELM HILL PIKE	**53**	Incomplete (Near Road)
470370011	Davidson	1015 TRINITY LANE	**39**	Incomplete
471570100	Shelby	5767 MACON COVE	**42**	Incomplete (Near Road)

(Average 1-Hour 98th Percentiles over 3 Years 100 ppb)

Data evaluated 2/7/2016.

Note there are 2 "Near Road" NO_2 sites that became operational during CY 2014 in Davidson and Shelby Counties.

Lead NAAQS

Lead is a toxic metal that can cause neurological impairment in humans, particularly children.

While once used as a performance additive in gasoline, it is now used mainly in lead acid storage batteries and in ionizing radiation shielding.

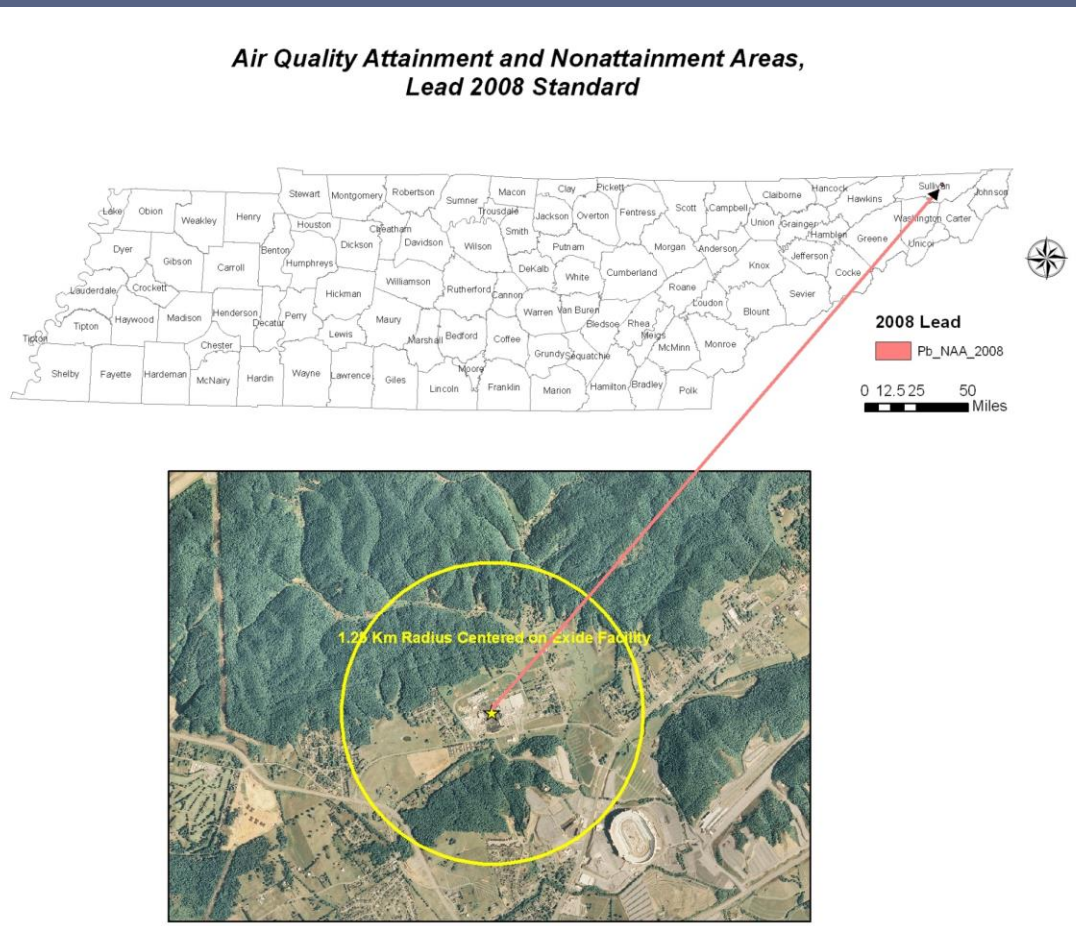
Lead

Lead Design Value Data 2013 - 2015

AQS ID	County	Site Location	3 Year DV Lead 2013 - 2015	Comments
470930023	Knox	1584 Ely Avenue, Knoxville	0.11	Incomplete
470930027	Knox	2522 BURNSIDE ST, Knoxville	0.03	Incomplete
470931017	Knox	1613 VERMONT AVENUE, Knoxville	0.02	Incomplete
471570075	Shelby	6388 Haley Rd. (Shelby Farms NCORE site)	0.00	Incomplete
471633004	Sullivan	364 Exide Dr	0.07	Incomplete

3-Month Rolling Average 3 year Max >=0.15 ug/m3
Data evaluated 2/7/2016.

Lead



2008 Lead NAAQS Nonattainment Area – Sullivan Co (partial)

- **Attained Standard in 2013**
- **Maintenance Plan & Redsignation Request submitted to EPA on 7/10/2015**

Carbon Monoxide NAAQS

- Arises from incomplete combustion of fossil fuels
- Chemically binds to hemoglobin, temporarily reducing oxygen carrying capacity of blood

Carbon Monoxide

Carbon Monoxide Design Value Data 2013 to 2015

				2013 to 2015				
AQS ID	Year	County	Site Location	2nd Max 1 Hr	Obs > 1 Hr Std	2nd Max 8 Hr	Obs > 8 Hr Std	Comments
470090101	2013	Blount	GREAT SMOKY MOUNTAINS NP LOOK ROCK	1.148	0	0.3	0	Low Recovery
470090101	2014			0.32	0	0.3	0	Low Recovery
470090101	2015			0.3	0	0.3	0	Low Recovery
470370021	2013	Davidson	700 BROADWAY	1.6	0	1.2	0	Low Recovery
470370021	2014		1113 ELM HILL PIKE	1.4	0	1.2	0	Low Recovery
470370021	2015			1.7	0	1.4	0	
471570024	2013	Shelby	416 ALABAMA AVENUE	2.4	0	1.9	0	
471570024	2014			1.4	0	0.9	0	Low Recovery
471570024	2015			1.2	0	0.9	0	Low Recovery
471570075	2013	Shelby	6388 Haley Rd. (NCORE site)	1.28	0	0.8	0	
471570075	2014			0.97	0	0.7	0	
471570075	2015			1.28	0	0.6	0	Low Recovery
471570100	2014		5767 Macon Cove (Near Road)	1.058	0	0.6	0	Low Recovery
471570100	2015			0.949	0	0.6	0	Low Recovery
471630007	2013	Sullivan	EASTMAN ROSS N.ROBINSON	2.8	0	0.9	0	
471630007	2014			1.2	0	0.9	0	
471630007	2015			1.4	0	1.0	0	

CO 1 Hr Standard 35 ppm (Not to be exceeded more than once per year.)

CO 8 Hr Standard 9 ppm (Not to be exceeded more than once per year - non-overlapping average.)

Data evaluated 02/7/2016.

Permits-by-Rule (based on current draft)

- A quicker, easier, and less expensive way to obtain authorization to construct, modify, or operate a source
- What is a Permit-by-Rule?
  - Source category or emissions unit specific
  - All of the regulatory requirements are put in APC's rules
  - Owner or operator of facility elects to be subject to a Permit-by-Rule instead of getting a permit

Permits-by-Rule (based on current draft)

- How will it work?
  - Submit a "notice of intent" (NOI) for a specific Permit-by-Rule
  - Receive a "notice of authorization" (NOA) to construct, modify, or operate the source (instead of a permit)
  - If activity or emissions unit has PTE < 5 tons/yr (and 1000 lb/yr HAP), Technical Secretary can determine that it is an "insignificant activity" and is exempt from needing a permit or NOA (in accordance with 1200-03-09-.04(4)(a))
  - Comply with the applicable rule

Permits-by-Rule (based on current draft)

- Who is eligible?
  - Sources identified in APC's rule 1200-03-09-.07, "Permits-by-Rule"
  - Sources that are not Title V Major
  - Sources that have not taken limits to opt out of Title V
  - Source NOT located in serious, severe, or extreme ozone nonattainment areas with PTE > 10 tons/yr of VOC and/or NOx
- How much does it cost?
  - Nothing –
- What source categories will be covered?
  - Initial list:
    - Gasoline Dispensing Facilities
    - Stationary Emergency Generators

Permits-by-Rule (based on current draft)

- When will this happen?
  - Proposal Spring, 2016
  - APC Board Adoption Summer, 2016
  - Effective end of 2016
- Implementation process to be developed

General Permits

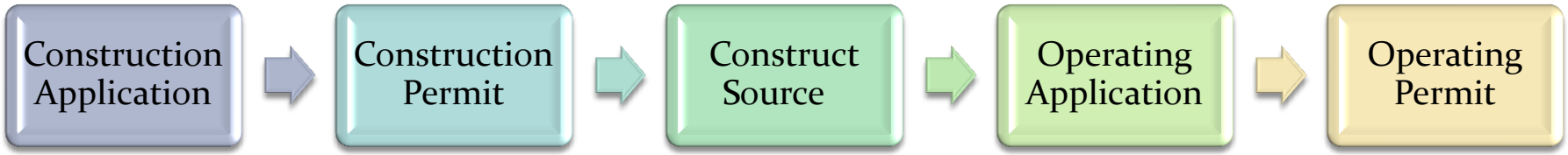
- A traditional air quality permit issued by APC that sources can voluntarily subject itself to.
- A general permit acts as both a construction and an operating permit.
- Only requires one Notice of Intent (NOI) from the source to be covered.
- Information about sources seeking coverage for a new source or modification will be posted to the TDEC website for public comment.

General Permits

- Advantages of a General Permit:
  - Uniform permit conditions
  - Faster issuance of a permit
    - May be able to cut the time in half that it takes to issue a permit
  - Less confusion
    - Only one permit application needed, rather than two as currently.
    - Uniform permit conditions resulting in uniform reporting and recordkeeping
- Current Status
  - Drafting General Permit for Dry Cleaners
  - Can expand to other source categories once process developed.

Combined Construction and Operating Permit

Current Permitting Process



Future Permitting Process

- Under Development Simultaneously as Permit-by-Rule
- Can be used for true minor sources only

Clean Power Plan – The Basics

- Rulemaking that EPA put into place to regulate greenhouse gas emissions from existing sources thought to be impacting climate change
- Based upon Best System of Emission Reduction Building Blocks
- The rule was appealed to the United States Supreme Court and has been stayed.
- Tennessee holding off on dedicating state resources to CPP compliance plan development until we know more about the outcome of ongoing litigation

Tennessee's Clean Power Plan Goals

	lb/MWh	tons	
2012 Baseline Emissions	2,015	41,222,026	
2020 EPA Projections (without CPP)	1,517	44,738,549	
	Final	Final – Existing Only	Final – Existing & New
Interim Goal 2022-2029	1,411	31,784,860	32,143,698
Step 1 (2022-2024)	1,531	34,118,301	34,265,552
Step 2 (2025-2027)	1,380	31,079,178	31,575,934
Step 3 (2028-2029)	1,275	29,343,221	29,812,562
2030 and Beyond Final Goal	1,211	28,348,396	28,664,994

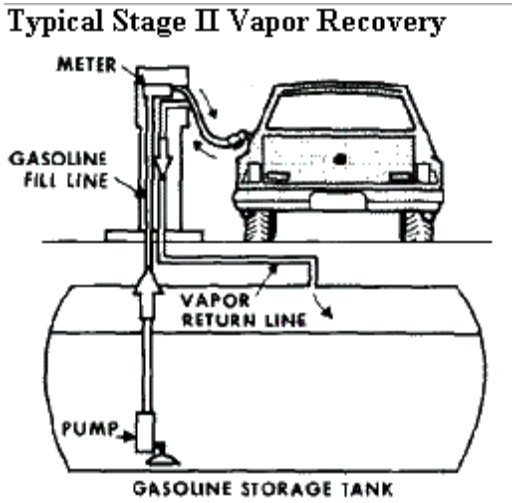
Reid Vapor Pressure (RVP)

- RVP is a measure of gasoline volatility
- EPA regulates RVP sold during June 1 to September 15
  - EPA's RVP Regulations are found at 40 CFR 80.27(a)(2)
- Nationwide Standard
  - 9.0 psi + 1.0 psi for gasoline containing 9 to 10% ethanol
- Certain areas that were designated nonattainment for the 1-hour ozone standard (~18 states)
  - 7.8 psi + 1.0 psi for gasoline containing 9 to 10% ethanol
  - Memphis Area:
    - Shelby County
  - Nashville Area:
    - Davidson County
    - Rutherford County
    - Sumner County
    - Williamson County
    - Wilson County

Reid Vapor Pressure (RVP)

- In order to relax the 7.8 psi RVP standard, an area must:
  - Be redesignated to attainment
  - Submit a demonstration that relaxation of the standard will not interfere with attainment or maintenance of any air quality standard (CAA section 110(l))
  - State must submit a request for EPA to amend their RVP regulations
  - State must be measuring attainment with current ozone standard (unofficial EPA policy)
- Status
  - Redesignations
    - Nashville redesignated to attainment 10/30/1996
    - Memphis redesignation request submitted 1/14/2016
  - 110(l) demonstrations
    - Memphis demonstration included in 1/27/2016 redesignation request
    - Nashville demonstration to be proposed Spring, 2016

Gasoline Dispensing Facilities – Stage II Gasoline Vapor Recovery



- Applies in Davidson, Rutherford, Sumner, Williamson, and Wilson Counties
- 11/12/2015 – APC Board Adopted Revision to require removal of Stage II Equipment
- Will become effective upon filing with Secretary of State (pending)
- Starting with effective date:
  - Remove existing Stage II equipment within 3 years
  - Decommission per Petroleum Equipment Institute Guidance
  - No new Stage II equipment required
- New gasoline dispensing facilities installed prior to effective date – obtain variance from APC board

Startup, Shutdown, and Malfunction SIP Call

- 5/22/2015 – EPA issues "SIP Call" notifying 36 states, including Tennessee, to correct specific conditions in their SIPs regarding exemptions from emission limits during periods of startup, shutdown, and malfunction.
- Tennessee Rules that EPA is requiring correction
  - Rule 1200-3-20-.07, LIMITATIONS ON EMISSIONS DUE TO MALFUNCTION, START-UPS, AND SHUTDOWNS - REPORT REQUIRED UPON THE ISSUANCE OF NOTICE OF VIOLATION
    - "excuse or proceed upon" language in 1200-3-20-.07(1) *(now 1200-03-20-.06(2))*
    - Admissibility of data as an excuse for "malfunctions, startups, and shutdowns", in 1200-3-20-.07(3) *(now 1200-03-20-.06(4))*
  - Rule 1200-03-05-.02, VISIBLE EMISSIONS REGULATIONS - EXCEPTIONS
    - "due allowance" for excess visible emissions due to startup and shutdown in 1200-03-05-.02(1)
- SIP Revisions Due to EPA 11/22/2016
- APC has been working with Region 4 Staff on possible rule changes
- 8/11/2015 - Tennessee Attorney General has filed petition in opposition of SIP Call

Small Business Environmental Assistance Program

- Established under the Clean Air Act Amended 1990
- Provides free, confidential, and technical assistance to small businesses
  - Mostly assists with air questions, but also handles water, waste, and other environmental questions.
- A small business is considered to be one that:
  - Has 100 or fewer employees and is not a Title V source
  - Or does not have a full time staff member dedicated to environmental compliance
- Directly assisted 158 companies or individuals in the last year from 48 different categories of businesses
- Working with TN DAPC on General Permitting, Permit-by-Rule, and Stage I/II rule revisions

Small Business Environmental Assistance Program

- Comprised of three components
- Small Business Environmental Ombudsman
  - Acts as an advocate for small businesses
  - Rule reviews
- Technical Assistance
  - Main role of the program
  - Informs businesses of new regulatory requirements
  - Directly assists small businesses with environmental questions
  - Provides workshops on different environmental topics
- Compliance Advisory Panel
  - 7 member panel of small business owners and community leaders
  - Gives advice and feedback on SBEAP content and outreach activities

Questions?

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