

# Air Quality Issues Update

LADCO Regional Air Quality Workshop

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# Ohio's Attainment Status

- The entire state is attainment for ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide...for now.
- Ohio has nonattainment areas for PM2.5.
- Ohio will have nonattainment areas for lead any day.

# Revising Standards

- U.S. EPA has been busy revising standards:
  - 2006: 24-hr  $PM_{2.5}$
  - 2008: Lead
  - 2010:  $NO_2$ ,  $SO_2$ , Ozone
- More to come:
  - 2011: CO,  $PM_{2.5}$



# Revised Standards

attainment status will change

Pollutant	Current NAAQS	Proposed NAAQS	Final Date	Designations	SIPs Due	Attainment
CO	9ppmv (8Hr) 35ppmv (1hr)	Oct 2010	May 2011			
Lead	0.15 ug/m3 (rolling 3-month)	5/20/08	10/15/08	Jan 2011 (round 1) Jan 2012( round 2)	July 2012 July 2013	Jan 2016 Jan 2017
NO2	0.053 ppmv (annual) 0.100 ppmv (1-hr)	6/29/09	1/22/10	Jan 2012 (unclassifiable) Jan 2016/17 (nonattainment)	July 2013	Jan 2021/22
PM2.5	15.0 ug/m3 (annual) 35 ug/m3 (24 hr)	Nov 2010	1997 2006	Dec 2004 Oct 2009	April 2008 Dec 2012	Apr 2010 Apr 2015
Ozone	0.075 ppmv (8-hr) 0.08 ppmv (8-hr) 0.12 ppmv (1-hr)	0.060-0.07 ppmv (8-hr) 7-15ppmv-hr (secondary) (01/06/10)	~10/31/10	Oct 2011	Feb 2014	2014-2031
SO2	30 ppbv (annual) 140 ppbv (24-hr)	50-100 ppbv (1-hr) (11/16/09)	6/2/10	Jun 2012	Feb 2014	Summer 2017

# OZONE





# Ozone Exceedances by Year (through October 1, 2010)

<b>Year</b>	<b>0.0125 ppm 1-hr</b>	<b>0.08 ppm 8-hr</b>	<b>0.075 ppm 8-hr</b>	<b>0.075 ppm 8-hr exceedance days</b>
2000	1	135	326	33
2001	2	250	738	55
2002	22	801	1436	65
2003	22	204	458	40
2004	None	25	178	30
2005	5	192	688	65
2006	None	39	236	39
2007	None	110	541	59
2008	None	32	171	26
2009	None	4	31	11
2010	None	20	163	32

# Impact of the “New” Standard

- 0.075 ppm Standard (163 exceedance in 2010)
  - Not being met in Cleveland, Cincinnati, Columbus, Youngstown and Marietta
- 0.070 ppm Standard (389 exceedance in 2010)
  - ++ Toledo, Steubenville, Dayton, and Lima
    - All monitors in the State exceeding except (2 of 49)
- 0.065 ppm Standard
  - +++ The last (841) exceedance in 2010) two monitors exceeding
- 0.060 ppm Standard (1693 exceedances in 2010)
  - ++++ Nothing left

*\*based on 2007-2009 data*



# The moving target .....

## *Obstacles in implementation*



- Litigation takes place and disrupts the schedule.
- The targeted level changes.
- The targeted schedule changes.
- U.S. EPA proposed to shorten the implementation schedule affecting the time States need to plan....
  - Approximately 4 months instead of 1 year for State designation recommendations.
  - Attainment demonstrations within 28 months of designations rather than 36.
- Implementation rule to be proposed with final standard by August 31, 2010.
- U.S. EPA doesn't meet their August 31, 2010 goal....now what happens to the schedule?

# What will be the impact of the new standard?

- Depends on US EPA implementation rules.....
  - How much time we will have to attain?
  - What will the thresholds be for classification?
- But will US EPA grant us until 2018 or will that require us to be “serious” or even “severe” nonattainment?
- Will CAA required controls be enough? Probably not.

PM<sub>2.5</sub>

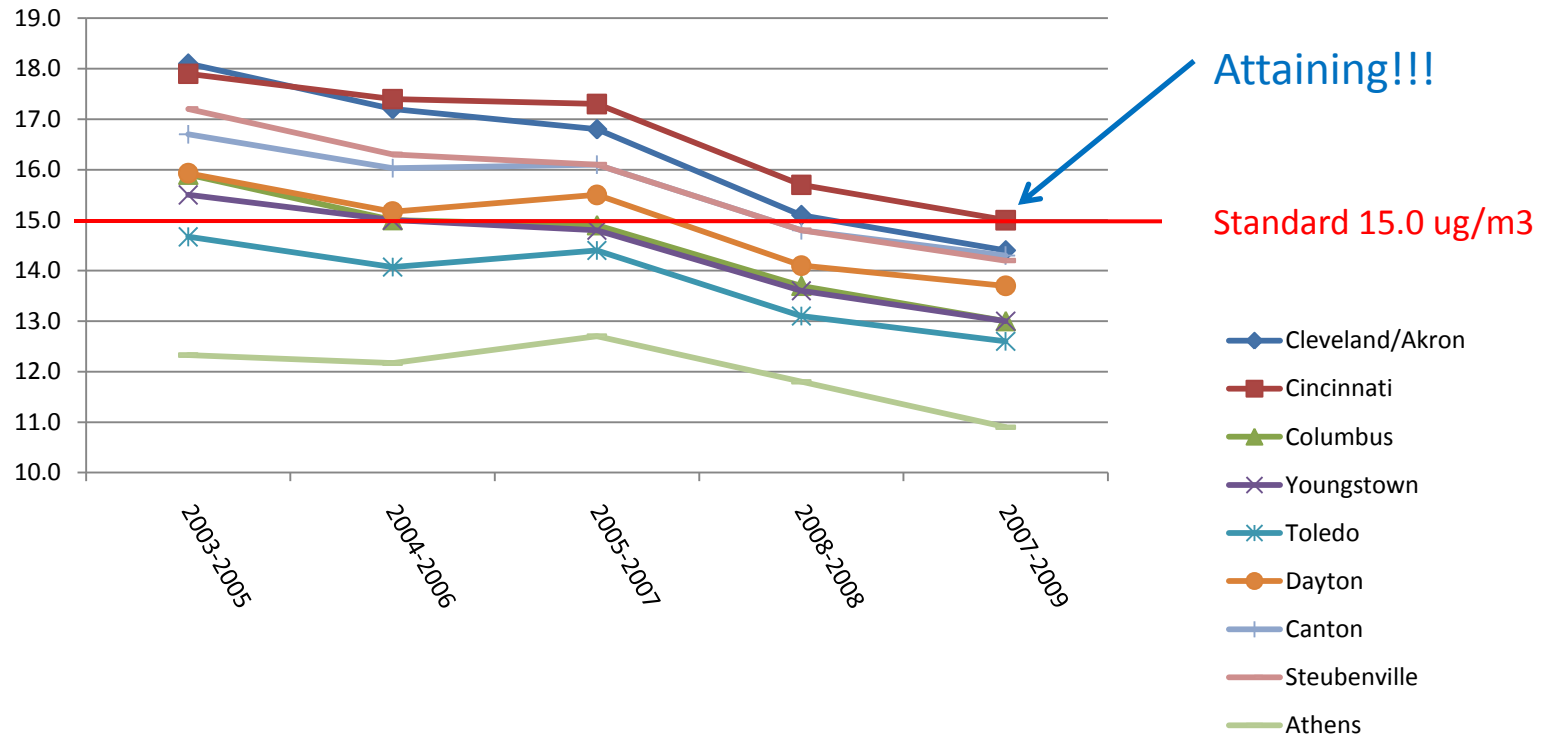


## PM2.5 Air Quality Standard

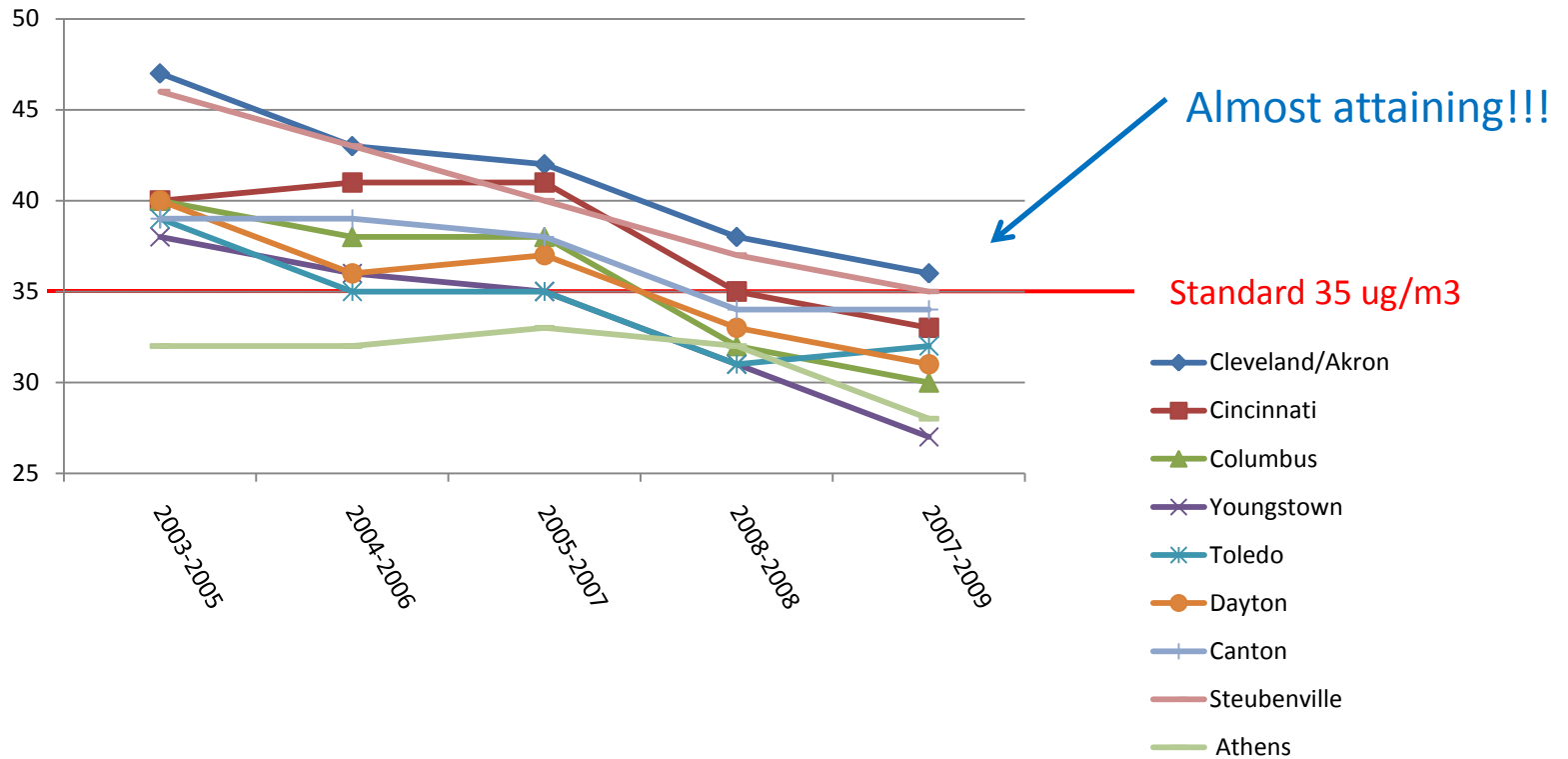
- Annual standard – 15 ug/m<sup>3</sup>, averaged over a three year period
- 24-hour standard- 65 ug/m<sup>3</sup> (old), 35 ug/m<sup>3</sup> (new)
- Anticipate new review with possible revised standards by October 2011.

	<b>Previous Standards</b>		<b>2006 Standards</b>	
	<b>Annual</b>	<b>24-hour</b>	<b>Annual</b>	<b>24-hour</b>
<b>PM<sub>2.5</sub> (Fine Particles)</b>	<b>15 ug/m<sup>3</sup></b> Annual arithmetic mean, averaged over 3 years (established in 1997)	<b>65 ug/m<sup>3</sup></b> 24-hour average, 98 <sup>th</sup> percentile, averaged over 3 years (established in 1997)	<b>15 ug/m<sup>3</sup></b> Annual arithmetic mean, averaged over 3 years	<b>35 ug/m<sup>3</sup></b> 24-hour average, 98 <sup>th</sup> percentile, averaged over 3 years
<b>PM<sub>10</sub> (Coarse Particles)</b>	<b>50 ug/m<sup>3</sup></b> Annual average (established in 1987)	<b>150 ug/m<sup>3</sup></b> 24-hr average, not to be exceeded more than once per year on average over a 3-year period (established in 1987)	<b>Revoked</b>	<b>150 ug/m<sup>3</sup></b> 24-hr average, not to be exceeded more than once per year on average over a 3-year period (established in 1987)

# Annual Standard Air Quality Trends



# 24-Hr Standard Air Quality Trends



# Annual PM2.5 Attainment

- PM2.5 Annual attainment demonstration, based on CAIR, submitted July 16, 2008.
  - Modeling showed all but one area would attain by 2010...used Weight-of-Evidence approach for Cleveland-Akron area.
- No additional controls beyond CAA requirements were necessary.
- All areas attaining based on 2007-2009 data.
- Submitted Clean Data request on April 1, 2010.

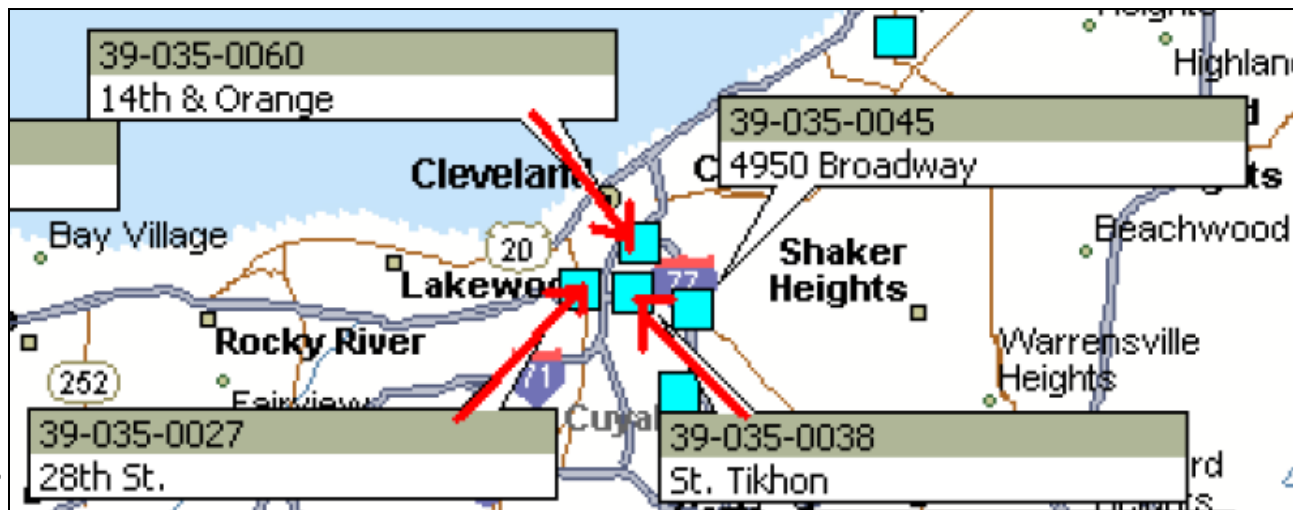


# Attaining the 24-Hr PM<sub>2.5</sub> Standard

- Designations December 14, 2009. Only three areas designated nonattainment:
  - Cleveland-Akron
  - Canton (showed attainment but did not meet 75% capture)
  - Steubenville (due to WV monitor)
- SIPs due December 2012.
- Initial modeling, with CAIR, shows only Cleveland will not meet the standard by 2015 with current controls.
  - Will likely use weight-of-evidence again.

# Attaining the 24-Hr PM<sub>2.5</sub> Standard: Cleveland

- Local issue (“flats”): Seven county nonattainment area even though only 3 monitors in Cleveland have shown nonattainment.



# Clean Air Transport Rule



# Clean Air Interstate Rule (CAIR)

- US EPA developed rules called Clean Air Interstate Rules (CAIR) to reduce emissions of nitrogen oxides (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) from power plants in the eastern US
  - Helps reduce ozone and PM and reduces visibility impairment
- Ohio has many coal-fired power plants and is a large emitter of NO<sub>x</sub> and SO<sub>2</sub>
- CAIR was going to require substantial emission reductions across eastern US and Ohio
- CAIR remanded December 23, 2008

# Clean Air Transport Rule (CATR)

- July 6, 2010, U.S. EPA proposed a replacement to the CAIR program, the Transport Rule.
- Should provide greater reductions than CAIR.
  - Necessitate year-round operation of existing SCR, SNCR and scrubbers.
  - Necessitate addition of pre-combustion NO<sub>x</sub> controls
  - Necessitate installation of new scrubbers for many sources.
- Expected to be finalized by Spring 2011 to allow NO<sub>x</sub> and SO<sub>2</sub> reductions in 2012 and further SO<sub>2</sub> reductions in 2014.

# Ohio EGU CATR Budgets vs Historical Emissions (tons)

Budgets

	<b>2012</b>	<b>2014</b>
<b>NOx Ozone</b>	40,661	-
<b>NOx Annual</b>	97,313	-
<b>SO2</b>	464,964	178,307

Historic

	<b>2005</b>	<b>2009</b>
<b>NOx Ozone</b>	51,875	36,076
<b>NOx Annual</b>	254,452	98,780
<b>SO2</b>	1,085,485	600,689

***\*\*CATR would produce substantial emission reductions in Ohio***

# Lead



# Lead Standard

- Revised October 15, 2008 – from 1.5 ug/m<sup>3</sup> to 0.15 ug/m<sup>3</sup> as a rolling 3-year monthly average.
- Two rounds – existing monitors and expanded monitoring network based on modeling potential violations from stationary sources.
- Designations from first round will be effective any day now. All areas are partial counties:
  - Fulton County – City of Delta area – Bunting Bearings Facility
  - Cuyahoga County – area surrounding Ferro Corporation
  - Logan County – south of City of Bellefontaine – Daido Facility (shutdown)
- Four new sites added for second round.....so far no monitored violations at the new sites.



# Lead Standard – Ferro “Situation”

- ❑ Cleveland – has processes that use 98% lead (lead oxide) powder.
- ❑ Highest three month average from 2005-2009 is 0.173 ug/m<sup>3</sup>.
- ❑ 2010 – spikes surface between January and March: 2.57 ug/m<sup>3</sup>, 1.39 ug/m<sup>3</sup>, 0.78 ug/m<sup>3</sup>
- ❑ Looking at other potential sources located near the monitor (scrap yards)
- ❑ Investigating Ferro operations in detail.
- ❑ Attainment demonstration due July 2012.
- ❑ Attainment date ~January 2016

# Nitrogen Dioxide



# New Standard – NO<sub>2</sub>

- New standard effective April, 12, 2010.
- The annual primary standard remains the same at 53 ppb, note the change in preferred units
- An annual 1-Hour standard is added: 100 ppb, which is met when the three year average of annual 98<sup>th</sup> percentile values are less than or equal to 100 ppb

# Ohio Attaining...for now

- Currently two areas monitored in Ohio (Cincinnati and Cleveland) show attainment.
  - Highest 3-year averages between 2002 and 2009 are 66 ppb in Cincinnati and 72 ppb in Cleveland
- Only county that currently fails is Cook Co., Illinois (Chicago), monitor next to bus stop.
- Expanded monitoring network requires two types of monitors:
  - Area wide (community) where CBSAs  $\geq 1,000,000$
  - Near roadway where CBSAs  $\geq 500,000$
- Monitoring plan due by July 2012 and network established by January 2013.

# Monitors needed in Ohio

<b>City</b>	<b>2008 Population</b>	<b>Road Monitors</b>	<b>Community Monitors</b>	<b>Current Monitors*</b>
Akron	698,553	1	0	0
Cincinnati	2,155,137	1	1	1
Cleveland	2,088,291	1	1	1
Columbus	1,773,120	1	1	0
Dayton	836,544	1	0	0
Toledo	649,104	1	0	0
Youngstown	565,947	1	0	0

# NO2 Timeline

- States submit nonattainment recommendations based on current monitors by January 22, 2011
  - Rumor has it U.S. EPA will be issuing a letter any day to say its not necessary
- Final designations by USEPA January 22, 2012
- After other monitors are installed and three years of data collected (2013-2015), additional designations will occur.
- Attainment demonstration due July 22, 2013
- Attainment date ~January 2017

# NSR Issues

- For permits issued by states with SIP-approved programs, permits issued on or after April 12, 2010 must contain compliance demonstration for 1-hour NO<sub>2</sub> NAAQS
- Although this effort appears to be mobile source driven, stationary sources are quickly being pulled in

# Sulfur Dioxide





# New Standard – SO<sub>2</sub>

- New standard effective August 23, 2010.
- Old Standard – 140 ppb – 24 hour average.
- New Standard– 75 ppb – 1 hour average.
- Requires expanded monitoring network based on population:
  - 3 monitors in CBSAs  $\geq 1,000,000$
  - 2 monitors in CBSAs  $\geq 100,000 < 1,000,000$
  - 1 monitors in CBSAs  $> 5,000$
- Monitoring plan due by July 2011 and network established by January 2013.

# Ohio Currently not Attaining

- Counties measuring above 75 ppb (2007-2009):
  - Belmont (97 ppb)
  - Columbiana (117 ppb)
  - Jefferson (129 ppb)
  - Lake (175 ppb)
  - Meigs (85 ppb)
  - Morgan (216 ppb)

# Dispersion Modeling– SO<sub>2</sub>

- Requires dispersion modeling to identify sources with potential to violate standard.
  - Threshold somewhere around 100 TPY.
- Based on the 2008 inventory, Ohio has 221 sources emitting  $\geq 100$  TPY (actual emissions).
  - 139 non-EGUs and 82 EGUs
- Will assist with nonattainment designations:
  - Nonattainment = monitored or modeled violations
  - Attainment = monitored and modeled “no” violations
  - Unclassifiable = all other areas

# SO2 Timeline

- States submit nonattainment recommendations by June 2011
- Final designations by USEPA June 2012
- After other monitors are installed and data collected, additional designations will occur.
- Basic plan (e.g. “maintenance”) due June 2013
  - Implementation plan for attainment and unclassifiable areas; includes:
    - Need for all modeling to be done so those with proven attainment can have plans developed.
    - Any required regulations be in place (e.g., limits necessary for attainment area sources).
- Attainment demonstration for nonattainment areas due February 2014.
- Attainment date ~August 2017.

The End

