

PM10/PM2.5 Test Method

EPA Webinar

2/2/2011

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OAQPS

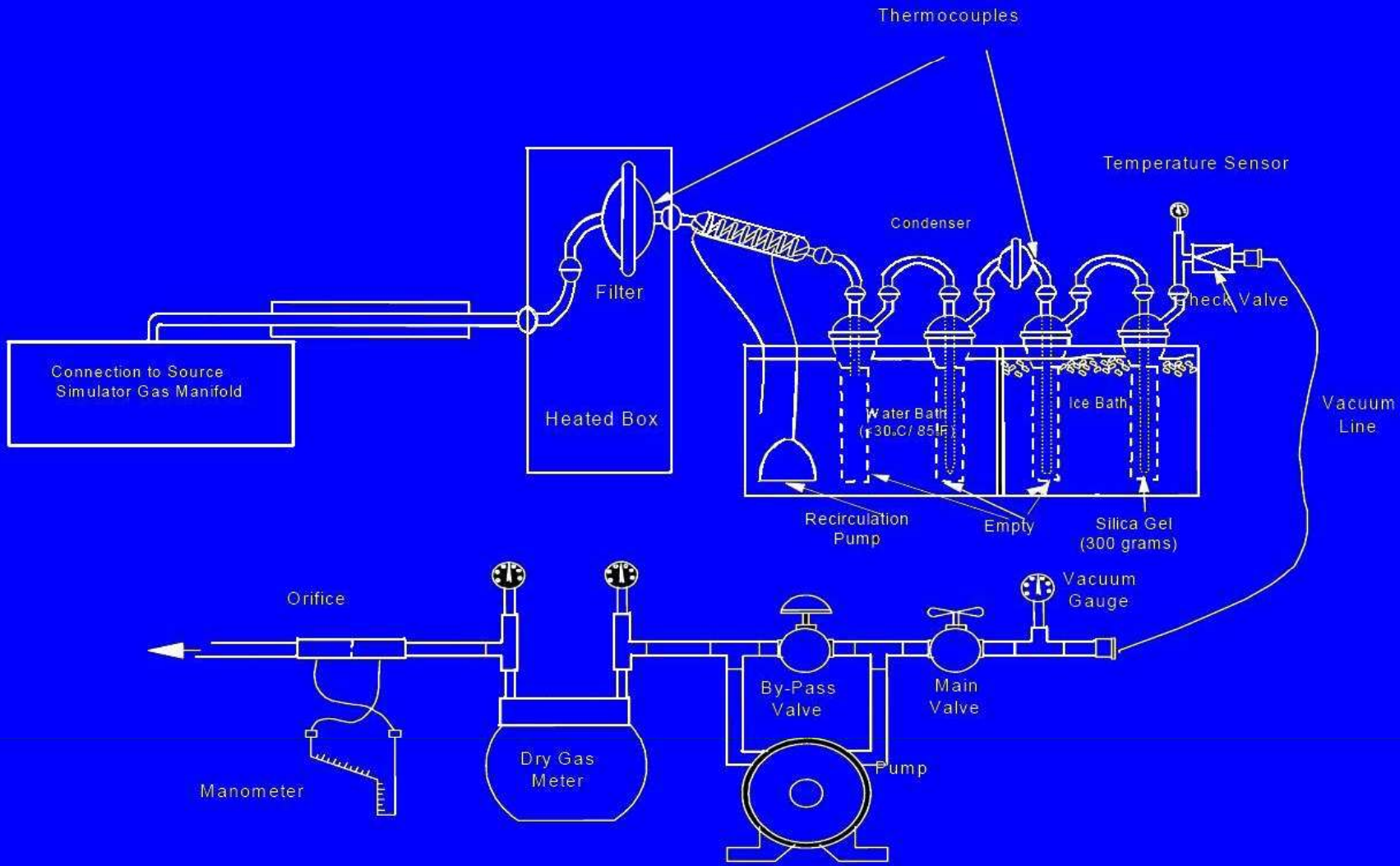


Presentation Topics

- Condensable PM test method
- Particle sizing test method
- Timeline
- Implications of new test methods
- Test method changes from proposal



Dry Impinger Train Layout



Dry Impinger Method Performance

Run	Organic (mg)	Inorganic (mg)	Filter (mg)	Total
1	0.11	2.23	-0.34	2.34
2	0.15	2.88	-0.06	3.03
3	0.09	1.37	0.00	1.46
4	0.30	1.91	0.00	2.22
5	0.16	1.54	0.07	1.77
6	0.33	2.19	-0.17	2.52
7	0.08	1.18	0.30	1.56
8	0.02	1.87	0.17	2.06
Blank	-0.02	0.21	0.00	0.68
Average	0.16	1.90	0.00	2.12
Std Dev	0.1	0.51	0.17	0.45
MDL	0.31	1.54	0.49	1.36



Dry Impinger Method Availability

- **November 2005 – AW&MA conference presentation on lab assessment of dry impinger method**
- **March 2007 – OTM 28 posted to EPA web page for use during transition period**
- **August 2008 – updated OTM 28**
- **March 2009 – OTM28 & proposed Method 202 posted**



Filterable PM Sizing

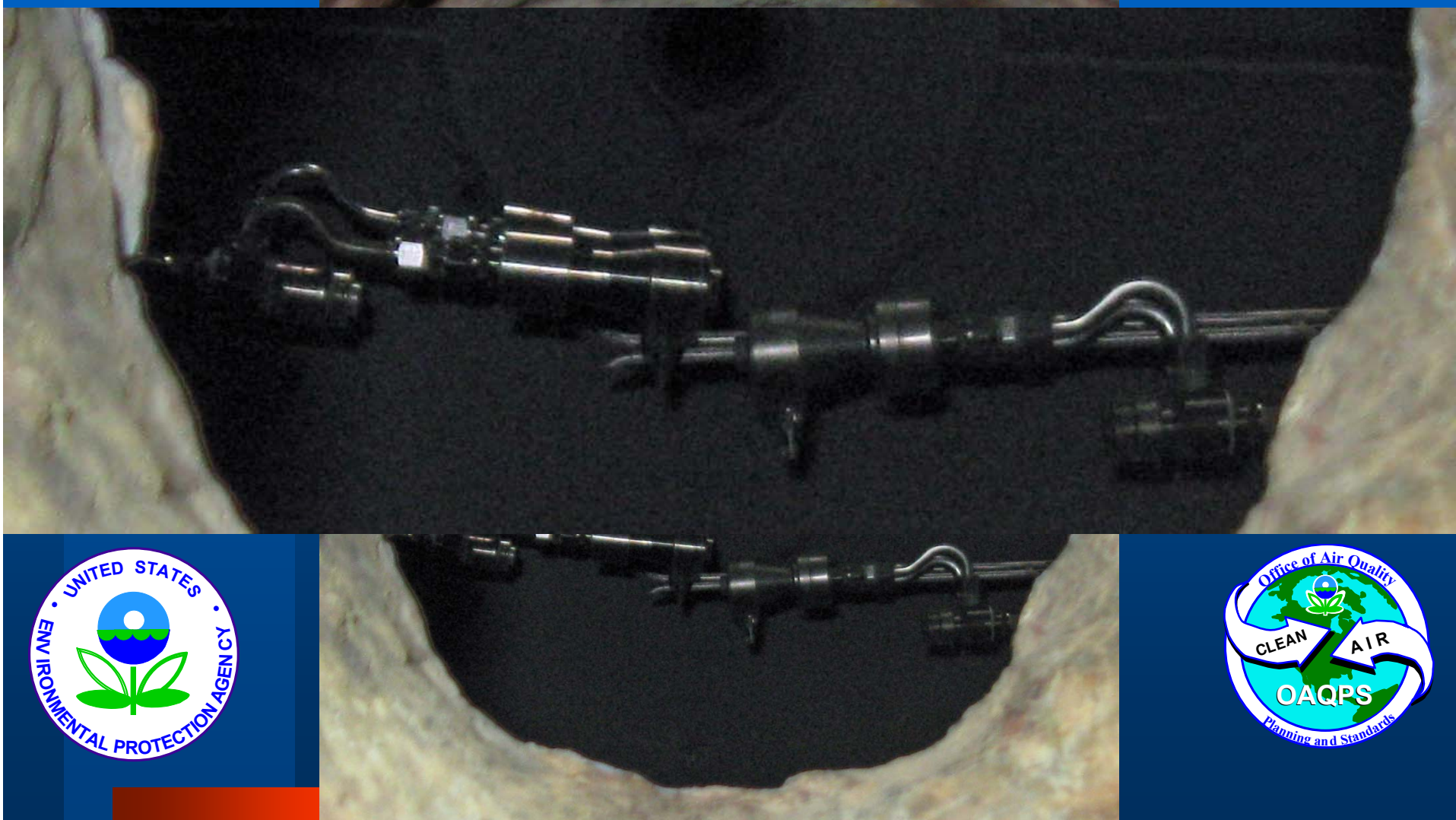
- **Method 201A (1990)**



- **Method 201A (2010)**

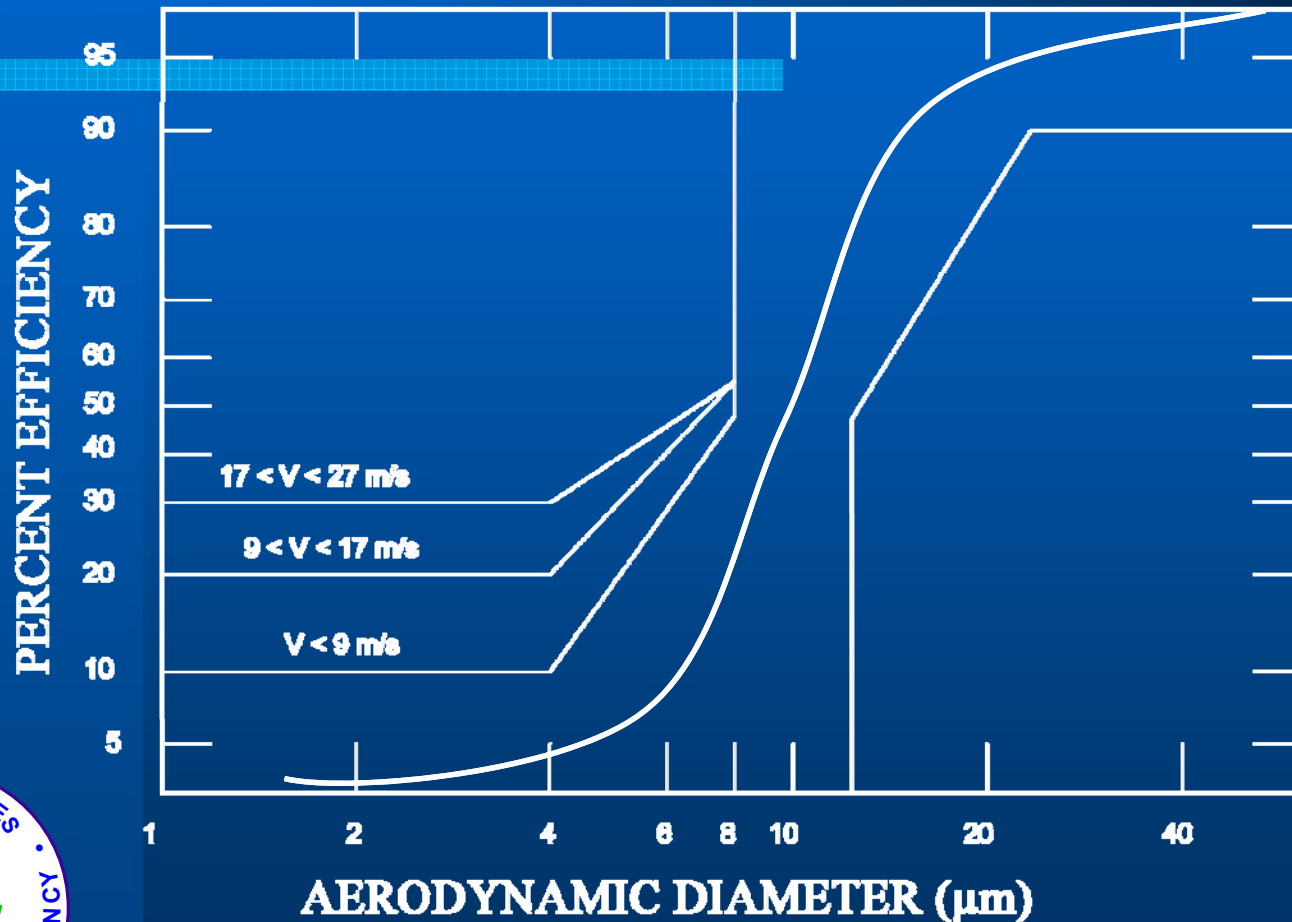


PM₁₀ & PM_{2.5} Precision Testing



LE1

Performance Criteria – PM₁₀



Efficiency Envelope for Alternatives to PM₁₀ Cyclone

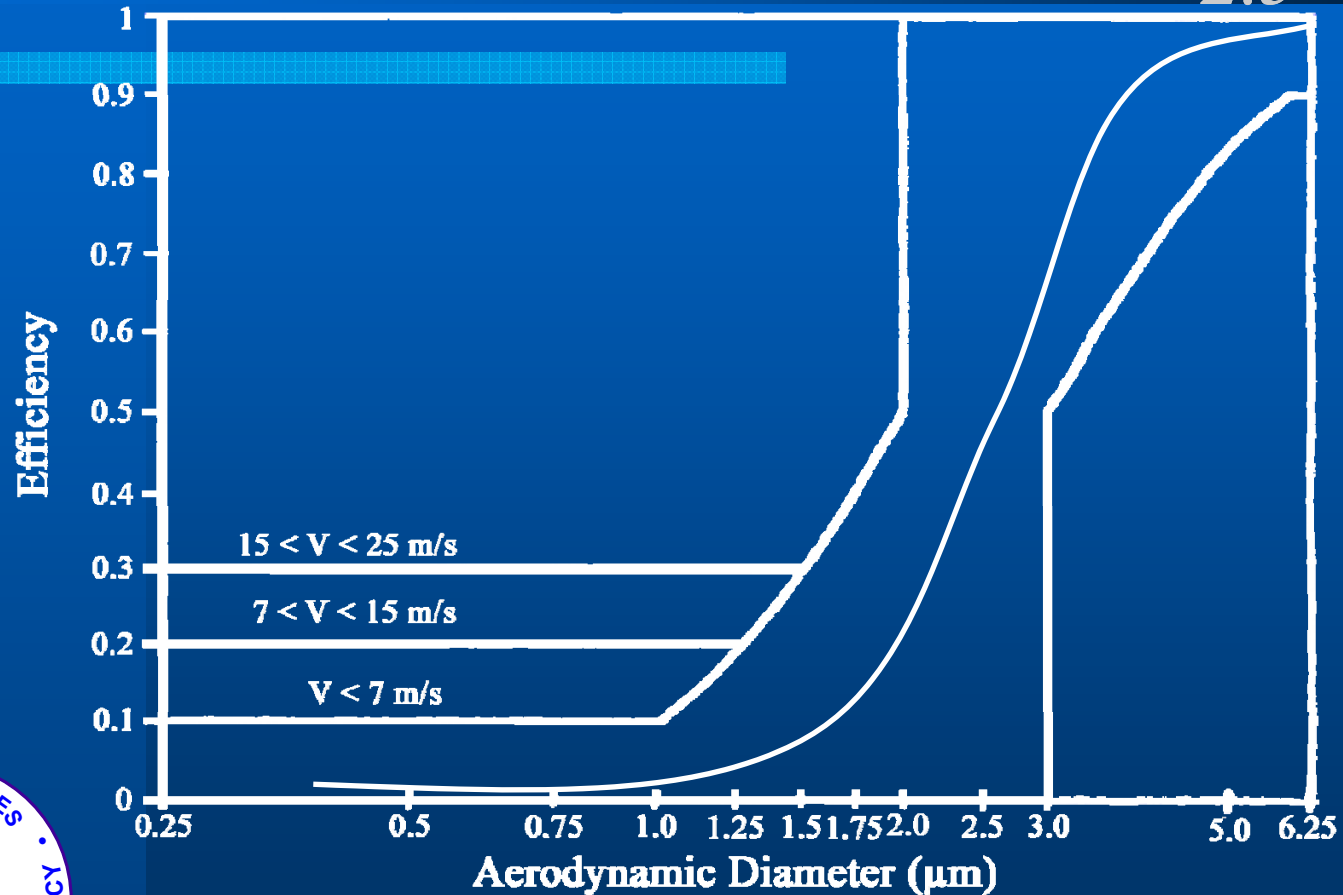
Slide 8

LE1

What does "performance criteria" mean? Does this slide represent what the sampling train actually accomplishes? Is this the criteria that other manufacture's sampling train would have to meet?

Larry Elmore, 1/14/2010

Performance Criteria – PM_{2.5}



Efficiency Envelope for Alternatives to PM_{2.5} Cyclone



Particle Sizing Method Availability

- **Basic Method developed in 1980's**
 - Sampler was 5 cyclones of various sizes to obtain particle size distribution
 - Largest cyclone was basis of PM10 cyclone (1990's Method 201A)
 - Smaller cyclone is basis PM2.5 cyclone
- **PRE 4 – Available before 2002**
- **OTM 27 – Reformatted from PRE 4 and posted August 2008**
- **OTM 27 & proposed Method 201A posted March 2009**



CPM Precision



Precision Testing Results

- Filterable PM_{2.5} precision ≈ 1 mg
- Total CPM precision ≈ 4 mg
 - Organic CPM precision ≈ 0.5 mg
 - Inorganic CPM precision ≈ 3.5 mg
- H₂SO₄ collection decreases with decreasing concentration
 - Once collected H₂SO₄ is retained
 - H₂SO₄ is good audit material



Timeline and Dates

- **Final PM Implementation Rule**

- April 25, 2007
- FR Vol 72, No 79, pg 20586

- **Proposed Test Methods**

- March 25, 2009
- FR Vol 74, No 56, pg 12970

- **Final Test Methods**

- December 21, 2010
- FR Vol 75, No 244, pg 80118



Recent PM Test Methods Dates

- **Signed by the Administrator on Dec 1**
- **Published in FR on Dec 21**
 - Effective date is January 1, 2011
- **Extensive Response to Comments**
 - Response to major issues in preamble
 - Responses to other issues in RTC document
- **Several minor changes from proposal**



Changes from proposal (M201A)

- **Added definitions**
 - Primary PM, PM₁₀, PM_{2.5}
 - Filterable PM
 - Condensable PM
- **Revised/clarified method applicability**
 - Small diameter stacks (blockage)
 - Wet stacks (water droplets)
 - Temperature limitations
 - Port size requirements
 - Particle sizing (PM₁₀ vs PM_{2.5} vs both)



Changes from proposal (M202)

- **Definitions of Primary PM, PM₁₀, PM_{2.5}**
- **Replaced MeCl with hexane**
- **Modified filter media specifications**
- **Added optional glassware preparation**
 - User determined – requires proof blank
 - Bake at 350°C – no proof blank
- **Clarified text in several areas**
 - Terminology (field blanks, proof blank)
 - Applicability for wet stacks
 - Use of pH indicators
 - Requirement to use cleaned glassware
 - Nitrogen purge specifications



PM_{2.5} Regulatory Requirements

- **Clean Air Fine Particle Implementation Rule**
 - Promulgated April 25, 2007
 - January 1, 2011 is critical date for PM_{2.5}
 - New or revised SIP rules must consider PM_{2.5} in setting limits
 - NSR/PSD permits must also consider PM_{2.5} in limits
 - Transition period was for development of improved knowledge using improved test method



Existing use of CPM Methods

- **Most States do not address CPM**
- **Some States address CPM**
 - States test methods for CPM are inconsistent
- **Only rules that are new or revised need consider CPM**
- **States do not have to use EPA's test method for acceptance of SIP or NSR/PSD rules**



Implications of considering PM_{2.5}

- **States w/o CPM testing now**
 - PM_{2.5} will need to be addressed in new or revised emissions limits
 - **Will likely adopt new test methods**
 - Higher numerical limits do not mean higher emissions
 - State will need good information to know where they are and what revised limits will achieve



Implications of considering PM_{2.5}

- **States w/ CPM testing now**
 - May convince EPA that their rules comply with intent of implementation rule
 - May wish to adopt new test method
 - Numerical limits will require adjustment
 - Adjustment requires careful consideration of what is currently measured vs what new method measures
 - Risk of errors may be greater than for States that are just now adopting CPM testing



Existing State Test Methods Influences

- **State prohibits nitrogen purge**
 - Sulfate artifact of 200 to 400 mg in 1m³ sample
 - Higher values for higher SO₂, high moisture and/or longer sample times
- **State requires nitrogen purge**
 - Sulfate artifact of 20 to 30 mg in 1 m³ sample
 - Higher values for higher SO₂, high moisture and/or longer sample times



Existing State Test Methods Influences (cont)

- **State prohibits nitrogen purge but allows correction for artifacts**
 - Correction may exceed actual artifact level
 - Correction may account for some artifact
 - Some compounds (chlorides, ammonium etc.)
- **State requires nitrogen purge and allows correction for artifacts**



Comments or Questions

