

HDR

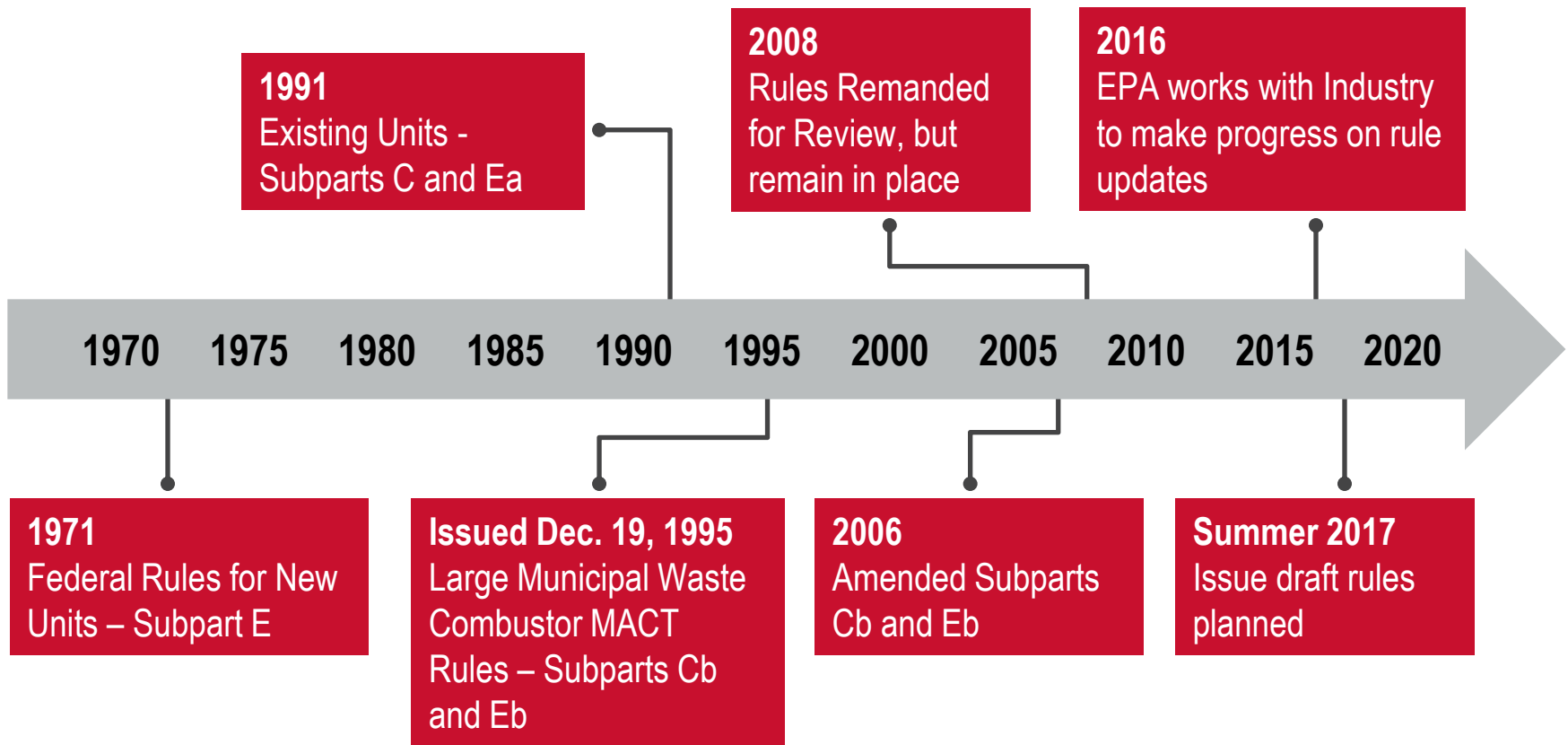


# EPA Solid Waste Combustor MACT Rulemaking Process

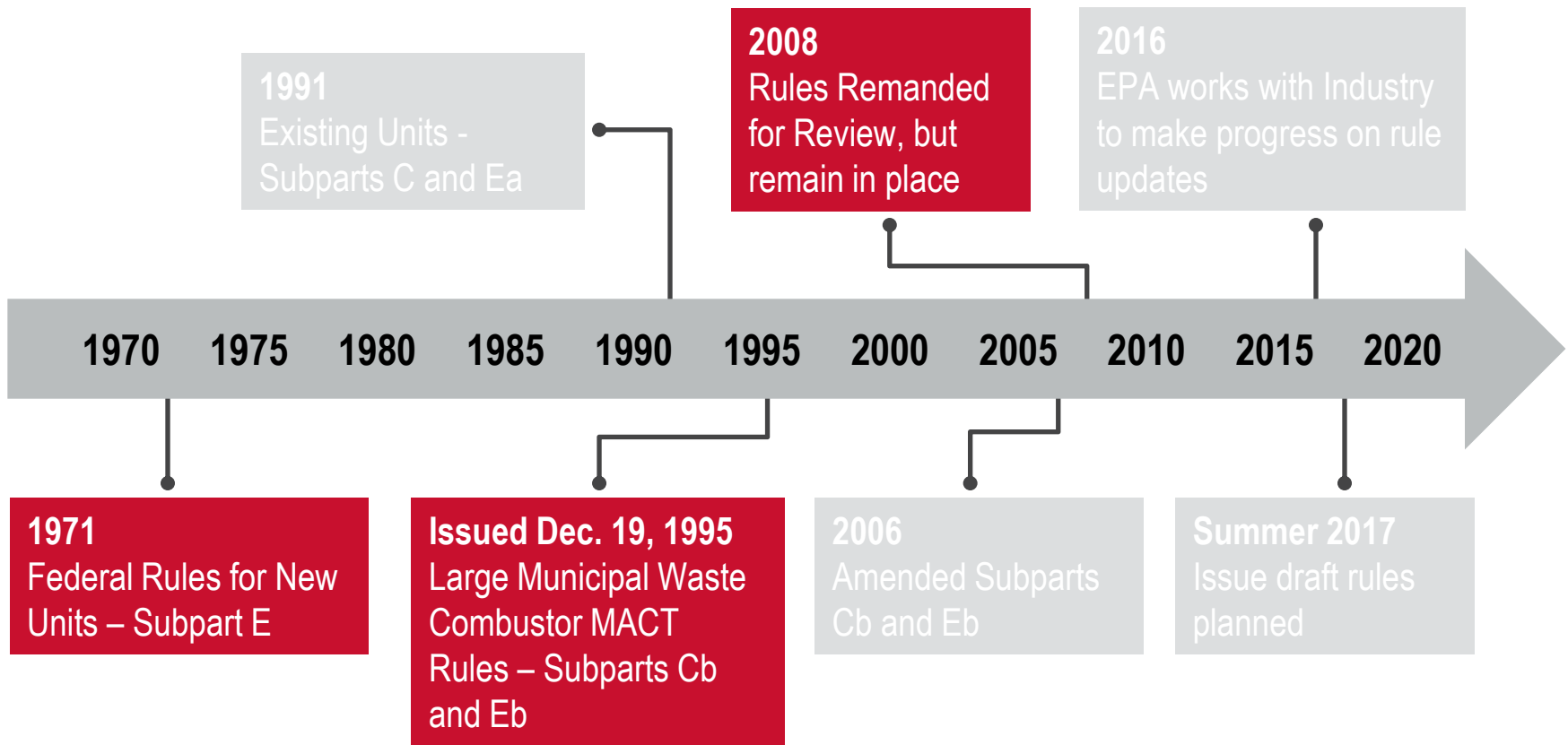
Greg Gesell, PE



# EVOLUTION OF THE MACT RULE

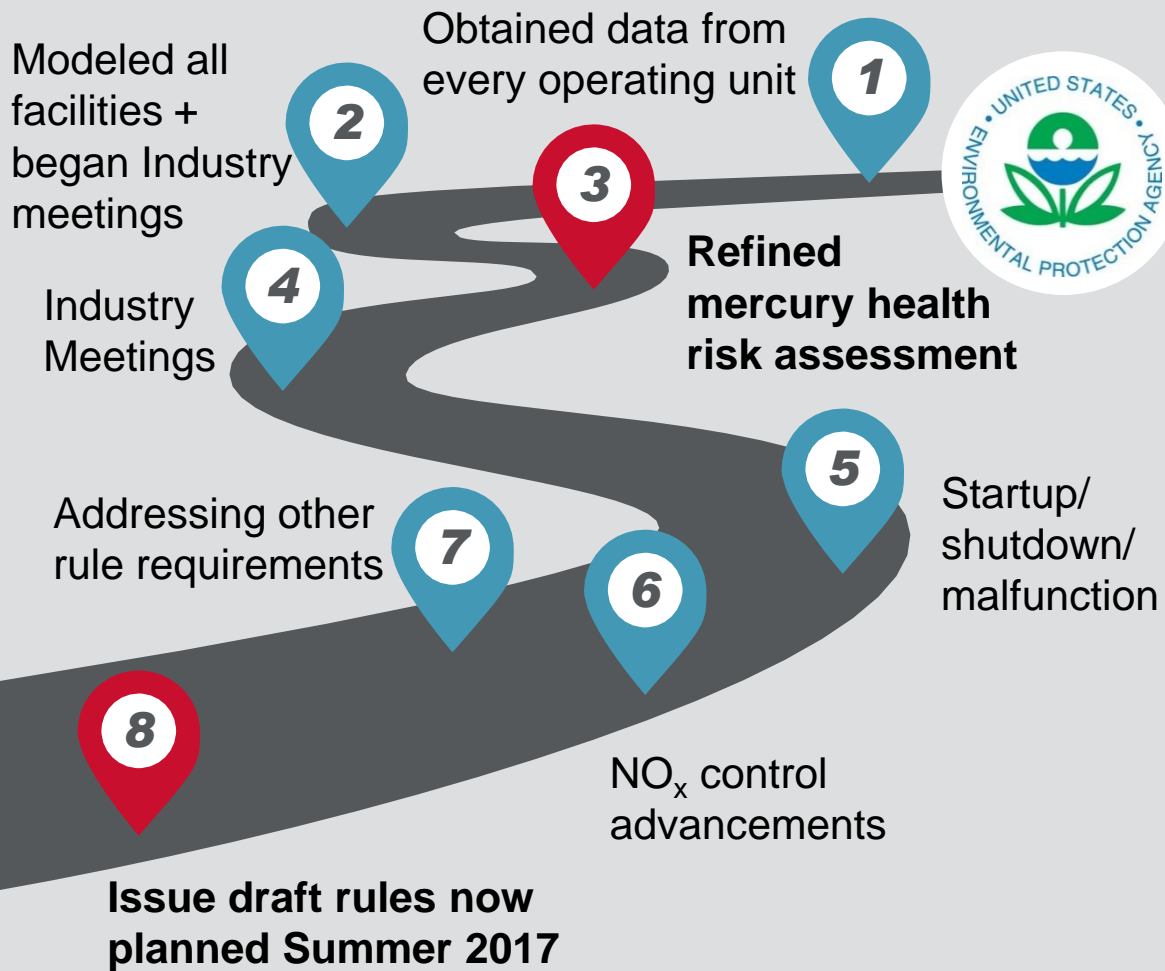


# EVOLUTION OF THE MACT RULE





# EPA'S PROGRESS



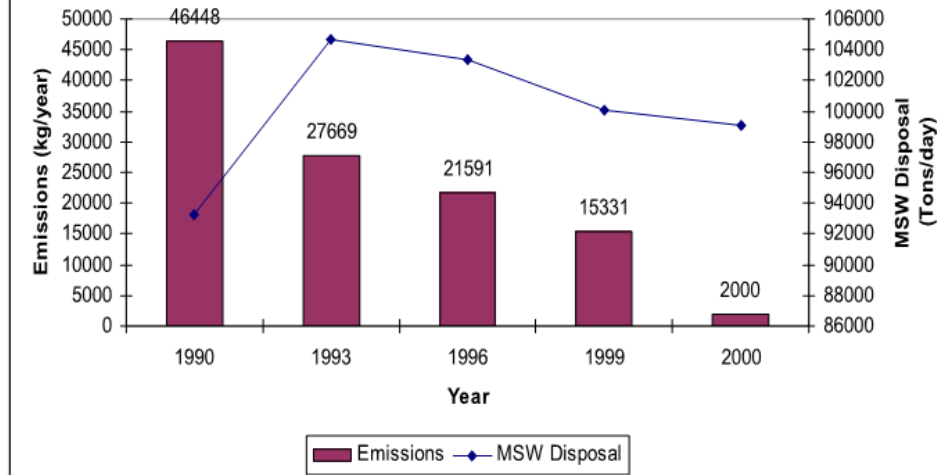
**FOCUS ON**

**WHAT'S IN**

**THE RULE &**

**THE IMPACTS**

**USA MWC Mercury Emissions 1990-2000**



**Total Emissions from All Large and Small MWC in the U.S. in 1990 and 2005**

Pollutant	1990 Emissions	2005 Emissions	Reduction (%)
NO <sub>x</sub>	64,900	49,500	24
SO <sub>2</sub>	38,300	4,600	88
HCl	57,400	3,200	94
PM	18,600	780	96
Pb	170	5.5	97
Hg	57	2.3	96
Cd	9.6	0.4	96
D/F (total, not TEQ)	4.85 x 10 <sup>-3</sup>	1.65 x 10 <sup>-5</sup>	99+

Memorandum. Stevenson, Walt of EPA to Docket EPA-HQ-OAR-2005-0117. August 10, 2007.



**POTENTIAL**

**CHANGES +**

**IMPLICATIONS**

## **EMISSIONS:**

- Mercury Issue Resolved?
- NOx Control Advancements
- Acid Gas Control
  - SO<sub>2</sub>
  - HCl
- PM and Metals
- Dioxins
- CO





**POTENTIAL  
CHANGES +  
IMPLICATIONS**

## **CONTINUOUS EMISSION MONITORING:**

- New CEMS
  - HCl (Already an Alternative)
  - PM (Already an Alternative)
  - Mercury
  - Metals
  - Dioxin
- Availability Requirements Not Tied to Compliance
- Number of Valid Data Points





**POTENTIAL**

**CHANGES +**

**IMPLICATIONS**

## **OTHER POSSIBLE CHANGES:**

- Startup/Shutdown/Malfunction
  - Adapt Reasonable Requirements from CISWI or other Rules or Develop Our Own
  - 30-day Rolling Average
  - No O<sub>2</sub> Adjustment
- Additional Likely Changes
  - ESP Classification
  - SCR for New Units
  - Solid Waste Applicability

# Other Potential Issues/Opportunities

- Testing
  - Maintain Concentration or Reduction Options
  - Avoid Quarterly Testing or CEMS
- Reporting
  - Reduce Reporting Duplication
  - Improve Timing
  - Electronic Reporting CEDRI
  - Publically Displayed





## Less Likely Federal Changes

- Work Practice Standards
  - Energy Assessment
  - Efficiency Requirements
- Other Pollutant Requirements
  - PM 2.5 and Condensibles
  - Nano Particles
  - Emission Rate Requirements





## ***WHAT CAN YOU DO?***

- Leverage Resources: ERC, SWANA, ASME, Others
- Know Plant's Bottom Line
  - Review Emission History + Potential Replacement Needs
  - Understand Operating + Capital Costs
  - Develop a Plan + Priorities
- Don't Forget About Your State Agency!

***ENGAGE NOW***

***TO HELP SHAPE***

***THE RULE***





# Objectives

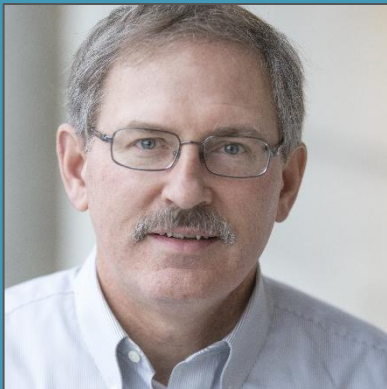
## **MACT RULE**

- MACT Rule Update With Few New or More Stringent Requirements
- Revise Pollutant-by-Pollutant Analysis
- No Major Emission Changes
- No Additional CEMS and Increased Flexibility
- SSM Provisions that Work
- Streamlined Reporting
- Delay rule?

## **NON-MACT RULE**

- Industry Support and Growth
- Ash
  - Validation of 4 Walls Approach
  - Advancement and Support of Ash Re-use
- Incorporation in Any Infrastructure Incentives
- Favorable Tax Provisions
- Strengthen Renewable Portfolio Provisions

# **QUESTIONS?**



**GREG GESELL**

(402) 399-4978

[gregory.gesell@hdrinc.com](mailto:gregory.gesell@hdrinc.com)



**JOHN CLARK**

(201) 335-9456

[john.clark@hdrinc.com](mailto:john.clark@hdrinc.com)



**BRUCE HOWIE**

(914) 993-2062

[bruce.howie@hdrinc.com](mailto:bruce.howie@hdrinc.com)



HDR

<b>NEW UNITS</b>	<b>Subpart E</b>	<b>Subpart Ea</b>	<b>Subpart Eb</b>	
Parameter*	1971	1991	1995	2006
Particulate (PM) mg/dscm	183	34	24	20
Dioxins ng/dscm		30	13	13
SO <sub>2</sub> ppmdv or Reduction		30, 80%	30, 80%	30, 80%
HCl ppmdv, or Reduction		25, 95%	25, 95%	25, 95%
CO, ppmdv**		100	100	100
Cadmium, mg/dscm			0.020	0.010
Lead, mg/dscm			0.200	0.140
Mercury mg/dscm or Reduction			0.080, 85%	0.050, 85%
Opacity, %		10%	10%	10%
NO <sub>x</sub> , ppmdv		180	150 (180 1 <sup>st</sup> yr.)	150 (180 1 <sup>st</sup> yr.)
Fugitive Ash, %			5%	5%

\*All emission levels corrected to 7% O<sub>2</sub>; Emissions stated for mass burn units unless noted otherwise.

\*\*Mass Burn Units

<b>NEW UNITS</b>	<b>Subpart E</b>	<b>Subpart Ea</b>	<b>Subpart Eb</b>	
Requirement	1971	1991	1995	2006
Testing	Initial Test	Every 12 months	Expanded	Between 9-15 months between tests
Reporting and Recordkeeping	Record Operation	Maintain 2 years, Annual Report 1/4ly Excess	Maintain 5 yrs, Semi-annual report	Maintain 5 yrs, Semi-annual report
COMS		Yes	Yes	Yes
CEMS		CO, SO <sub>2</sub> , NO <sub>x</sub>	No change	No change
CEMS RATA		Yes	Yes	Revised for CO and SO <sub>2</sub>
CEMS Option				PM and Hg
CEMS Hours Availability		75% hrs/d, 75% d/month, 2 data points/hr	75% hrs/d, 95% d/quarter, 2 data points/hr	90% per quarter, 95% per yr, 2 points/hr



NEW UNITS	Subpart E	Subpart Ea	Subpart Eb	
Unit Load		110% with Stm Measurement	Allows FW Measurement	No change
PM Control Operating Temperature		30° F above demonstrated	No change	No change
Fugitive Ash			Annual Test	No change
Operator Training and Certification		Subject to ASME QRO 1989	Subject to ASME QRO 1994	No change
Operator On Site		Yes	Stand-in Provisions	Clarified Provisions
Operating Manual		Updated and Review Annually	No change	No change
Carbon Averaging Requirements			Required	8-hr Block
Carbon Measurement			Required	Allow Carbon Injection Pressure
Reduced Testing for Dioxin			If 2 yrs below 7 ng/dscm all units	No change
Startup/Shutdown/Malfunction		Excluded but limited to 3 hours	No change	Excluded but noted
Public Notices		Notice to Construct	Inc. Siting, Material Separation & Meetings	Expanded

EXISTING LARGE UNITS	Subpart Ca	Subpart Cb	
Parameter	1991	1995	2006
Particulate (PM) mg/dscm	Very Large 34	Large 27	25
	Large 69		
Dioxins ng/dscm	Very Large 60	Fabric Filter 30	30
	Large 125		
	RDF 250	ESP 60	35
SO <sub>2</sub> ppmdv or Reduction	Very Large 30, 70%	29, 75%	29, 75%
	Large 30, 50%		
HCl ppmdv, or Reduction	Very Large 25, 90%	29, 95%	29, 95%
	Large 25, 50%		
CO, ppmdv**	100	100	100
Cadmium, mg/dscm		0.040	0.035
Lead, mg/dscm		0.440	0.400
Mercury mg/dscm, or Reduction		0.080, 85%	0.050, 85%
Opacity, %	10%	10%	10%
NO <sub>x</sub> , ppmdv		205**	205**
		RDF 250	250
Fugitive Ash, %		5%	5%

\*All emission levels corrected to 7% O<sub>2</sub>; Emissions stated for mass burn units unless noted otherwise. In some cases, such as for CO and NO<sub>x</sub> performance for other types of units is not noted.

\*\*Mass Burn

EXISTING LARGE UNITS	Subpart Ca	Subpart Cb	
Requirement	1991	1995	2006
Testing	Same as Ea except for NOx	Same as Eb	No change
Reporting and Recordkeeping	Same as Ea	Same as Eb except no siting	No change
COMS	Yes	Yes	Yes
CEMS	Same as Ea	Same as Eb	Same as Eb
CEMS RATA	Yes	Yes	Same as Eb
CEMS Option			PM and Hg
CEMS Hours Availability	Same as Ea	Same as Eb	Same as Eb
Unit Load	Same as Ea	Same as Eb	No change
PM Control Operating Temperature	Same as Ea	Same as Eb	No change
Fugitive Ash		Same as Eb	No change
Operator Training and Certification	Same as Ea	Same as Eb	No change
Operator On Site	Yes	Same as Eb	Same as Eb
Carbon Averaging Requirements		Same as Eb	Same as Eb
Carbon Measurement		Same as Eb	Same as Eb
Reduced Testing for Dioxin		2yrs below 15 ng/dscm	No change
Startup/Shutdown/Malfunction	Same as Ea	Same as Eb	Same as Eb

<b>NEW UNITS</b>	<b>Subpart Eb</b>
Parameter*	2006
Particulate (PM) mg/dscm	20
Dioxins ng/dscm	13
SO <sub>2</sub> ppmdv or Reduction	30, 80%
HCl ppmdv, or Reduction	25, 95%
CO, ppmdv**	100
Cadmium, mg/dscm	0.010
Lead, mg/dscm	0.140
Mercury mg/dscm or Reduction	0.050, 85%
Opacity, %	10%
NO <sub>x</sub> , ppmdv	150 (180 1 <sup>st</sup> yr.)
Fugitive Ash, %	5%

\*All emission levels corrected to 7% O<sub>2</sub>; Emissions stated for mass burn units unless noted otherwise.

\*\*Mass Burn Units



<b>NEW UNITS</b>	<b>Subpart Eb</b>
Requirement	2006
Testing	Between 9-15 months between tests
Reporting and Recordkeeping	Maintain 5 yrs, Semi-annual report
COMS	Yes
CEMS	CO, SO <sub>2</sub> , NO <sub>x</sub>
CEMS RATA	Revised for CO and SO <sub>2</sub>
CEMS Option	PM and Hg
CEMS Hours Availability	90% per quarter, 95% per yr, 2 points/hr

NEW UNITS	Subpart Eb
Unit Load	110% with Stm or FW Measurement
PM Control Operating Temperature	30° F above demonstrated
Fugitive Ash	Annual Test
Operator Training and Certification	Subject to ASME QRO 1994
Operator On Site	Clarified Provisions
Operating Manual	Updated and Review Annually
Carbon Averaging Requirements	8-hr Block
Carbon Measurement	Allow Carbon Injection Pressure
Reduced Testing for Dioxin	If 2 yrs below 7 ng/dscm all units
Startup/Shutdown/Malfunction	Excluded but noted
Public Notices	Expanded

EXISTING LARGE UNITS	Subpart Cb
Parameter	2006
Particulate (PM) mg/dscm	25
Dioxins ng/dscm	30
	35
SO <sub>2</sub> ppmdv or Reduction	29, 75%
HCl ppmdv, or Reduction	29, 95%
CO, ppmdv**	100
Cadmium, mg/dscm	0.035
Lead, mg/dscm	0.400
Mercury mg/dscm, or Reduction	0.050, 85%
Opacity, %	10%
NO <sub>x</sub> , ppmdv	205**
	250
Fugitive Ash, %	5%

\*All emission levels corrected to 7% O<sub>2</sub>; Emissions stated for mass burn units unless noted otherwise. In some cases, such as for CO and NO<sub>x</sub> performance for other types of units is not noted.

\*\*Mass Burn

EXISTING LARGE UNITS	Subpart Cb
Requirement	2006
Testing	Same as Eb
Reporting and Recordkeeping	Same as Eb except no siting
COMS	Yes
CEMS	Same as Eb
CEMS RATA	Same as Eb
CEMS Option	PM and Hg
CEMS Hours Availability	Same as Eb
Unit Load	Same as Eb
PM Control Operating Temperature	Same as Eb
Fugitive Ash	Same as Eb
Operator Training and Certification	Same as Eb
Operator On Site	Same as Eb
Carbon Averaging Requirements	Same as Eb
Carbon Measurement	Same as Eb
Reduced Testing for Dioxin	2yrs below 15 ng/dscm
Startup/Shutdown/Malfunction	Same as Eb



# EXAMPLE

Hypothetical Emissions Analysis									
Unit 1	2015				2016				
Run	1	2	3	Average	1	2	3	Average	Limit
HCl	4.4	5.7	4.5	4.9	7.5	7.2	8.5	7.7	29
	99	99	99	99	99	99	98	98	≥95
PM	0.93	1.6	1.7	1.4	2.9	2.4	2	2.5	25
Cadmium	0.001	0.0008	0.0006	0.0008	0.008	0.006	0.005	0.006	0.035
Mercury	<0.0009	<0.0010	<0.0007	<0.0009	<0.012	<0.012	<0.015	<0.014	0.05
Dioxins	10	9.1	4.3	8	9.4	6.9	2.3	6.2	30
Unit 2	2015				2016				
HCl	11	13	12	12	4.6	3.9	5	4.5	29
	98	96	98	97	99	99	99	99	≥95
PM	6.8	6.5	7.3	6.9	3.2	3.9	1.9	3	25
Cadmium	0.001	0.0007	0.0005	0.0008	0.0011	0.0008	0.0005	0.0008	0.035
Mercury	0.013	0.01	0.009	0.011	0.007	<0.006	<0.004	<0.006	0.05
Dioxins	19	21	23	21	5.4	6	6.4	5.9	30