

# EPA Enforcement: National Petroleum Refinery Initiative

# Petroleum Refinery Initiative

## Four Program Areas — Sources of Refinery Emissions (“Marquee” Issues)

- **New Source Review/Prevention of Significant Deterioration (NSR/PSD)**
  - Fluidized Catalytic Cracking Units (FCCUs)
  - Heaters and Boilers
  
- **New Source Performance Standards (NSPS)**
  - Flares
  - Sulfur Recovery Units
  - Fuel Gas Combustion Devices (including heaters & boilers)
  
- **Leak Detection and Repair (LDAR)**
  
- **Benzene**

# Refinery National Strategy

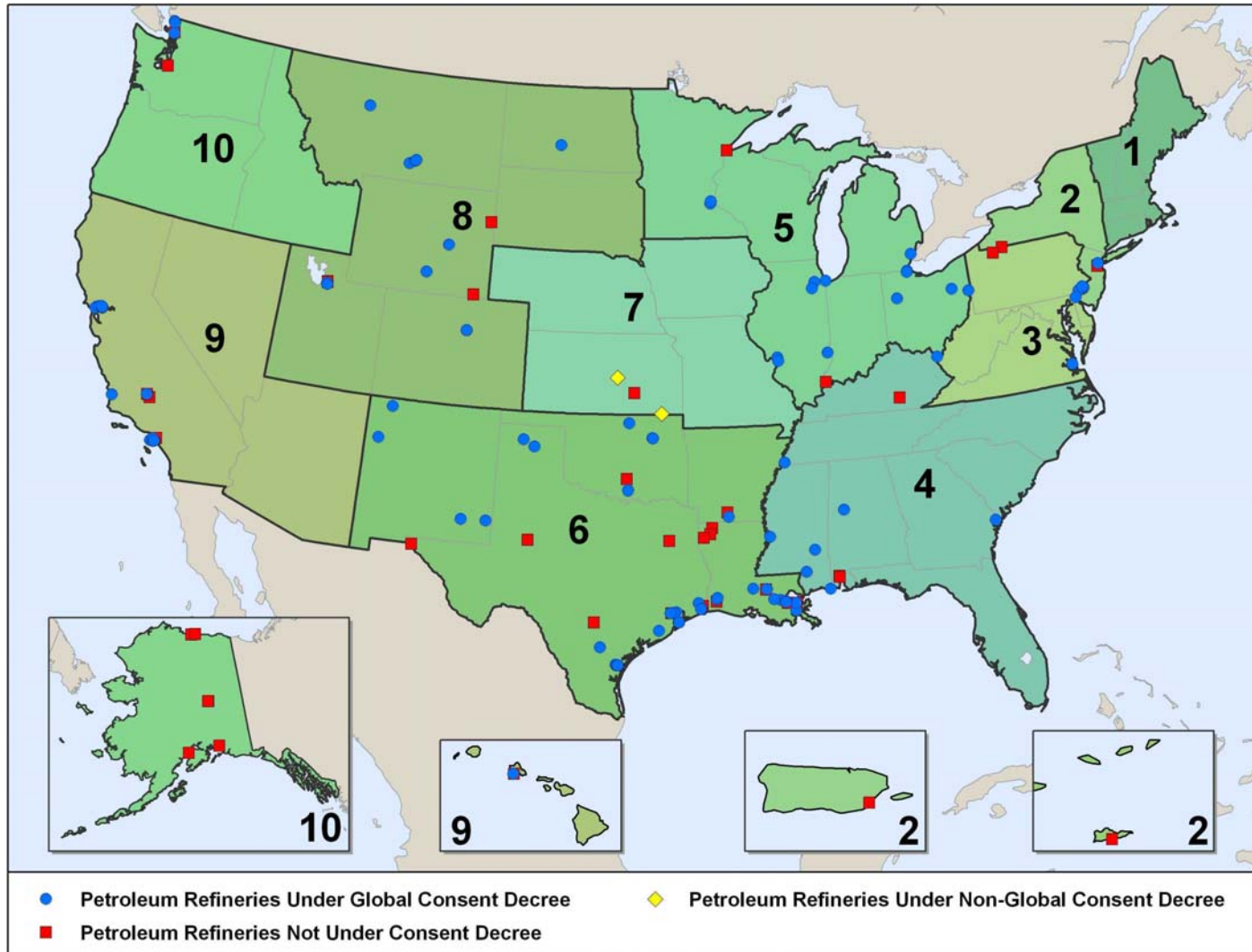
- National Priority Goals:
  - EPA met its primary goal to cover of 80% of the nation's domestic refining capacity under the Petroleum Refinery Initiative, by entering into settlements with refiners addressing all four "marquee" issues by the end of FY 05.
  - Having met the primary goal as a national enforcement priority, the strategy to address the petroleum refining sector has returned to EPA's "core" enforcement program.
  
- Level Playing Field:
  - EPA is continuing its work in this sector to address these issues with refiners representing the remaining 14% of domestic capacity not under consent decree.
  - As of May 2008, companies representing 84% of total domestic refining capacity are under settlement, and negotiations are underway with other refiners not currently under settlement.

# Refinery National Strategy

- **As of May 2008:**
  - **Approximately 84% of the nation's refinery capacity is under lodged or entered "global" settlements ("global" settlements address marquee issues at refineries company-wide)**
    - Referrals to the Department of Justice for refiners representing more than an additional 10% of domestic refining capacity
  - **Settlements to date represent:**
    - 22 refiners
    - 96 refineries
    - \$5 billion in capital costs for new control technologies
    - \$72 million in civil penalties
    - \$65 million in environmental projects (such as the installation of additional controls and equipment to further reduce refinery emissions, emergency response equipment for local communities, and wildlife habitat restoration)
    - Located in 28 states
  - **Emissions reductions from FCCUs, sulfur recovery units, heaters and boilers, flares:**
    - More than 86,000 tpy NO<sub>x</sub>
    - More than 245,000 tpy SO<sub>2</sub>

(estimated annual reductions when all current settlements are fully implemented)

# U.S. Petroleum Refineries



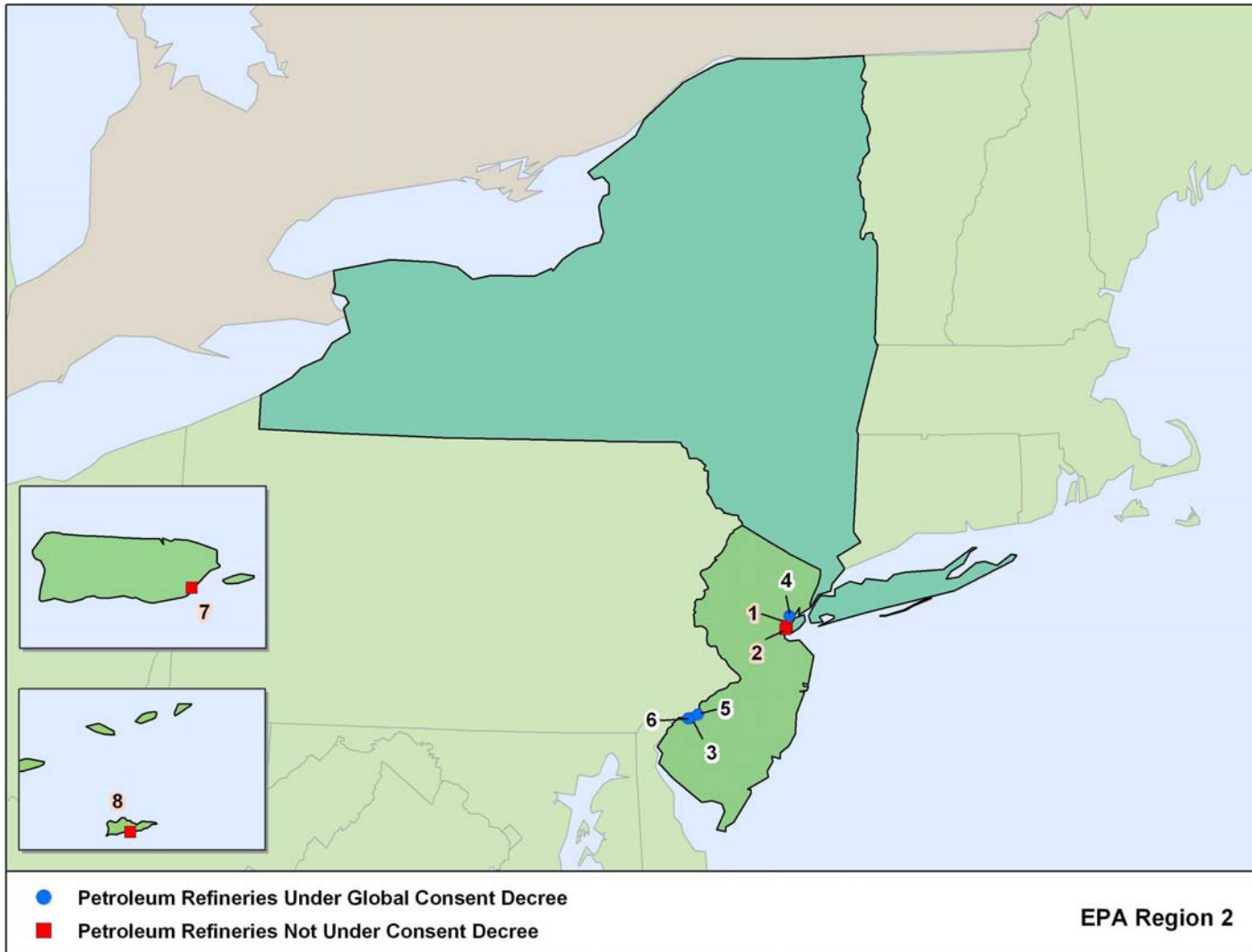
# U.S. Petroleum Refineries

(BP, Chevron, CHS, CITGO, Coastal, Conoco, ConocoPhillips, ExxonMobil, Giant, Koch, Lion, Marathon, M-E-DP, Montana-Navajo, Sunoco, Total Petrochemicals, Valero/Premcor, Hunt, Sinclair)

| <b>National Crude Petroleum Refining Capacity</b> |   |                                      |                                     |
|---|---|--------------------------------------|-------------------------------------|
| <b>EPA Region</b>                                 | <b>Crude Refining Capacity under CD</b>         | <b>Total Crude Refining Capacity</b> | <b>Percent of Capacity under CD</b> |
| Region 1  | No petroleum refineries are located in Region 1 |                                      |                                     |
| Region 2  | 638,000   | 1,348,500                            | 47                                  |
| Region 3  | 958,300   | 1,035,000                            | 93                                  |
| Region 4  | 831,225   | 941,725                              | 88                                  |
| Region 5  | 2,264,700                                       | 2,321,450                            | 98                                  |
| Region 6  | 7,310,239                                       | 8,289,019                            | 88                                  |
| Region 7  | 182,200   | 292,200                              | 62                                  |
| Region 8  | 511,200   | 632,200                              | 81                                  |
| Region 9  | 1,897,300                                       | 2,092,300                            | 91                                  |
| Region 10   | 465,000   | 996,275                              | 47                                  |
| <b>U.S. Total</b>                                 | <b>15,058,164</b>                               | <b>17,948,669</b>                    | <b>84</b>                           |

Capacity data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005, except as noted on following Region slides.

# Region 2 Petroleum Refineries



# Region 2 Petroleum Refineries

## Refineries under CD

### **New Jersey**

3. Citgo Asphalt Refining Co. – Paulsboro – 84,000
4. ConocoPhillips – Bayway – 238,000
5. Sunoco Inc. – Eagle Point – 150,000
6. Valero Energy Corp. – Paulsboro – 166,000

## Refineries not under CD

### **New Jersey**

1. Amerada Hess – Port Reading – 62,500 (FCCU capacity)
2. Chevron Corp. – Perth Amboy – 80,000

### **Puerto Rico**

7. Shell Chemical Yabucoa Inc. – Yabucoa – 73,000

### **U.S. Virgin Islands**

8. Hovensa LLC – St. Croix – 495,000

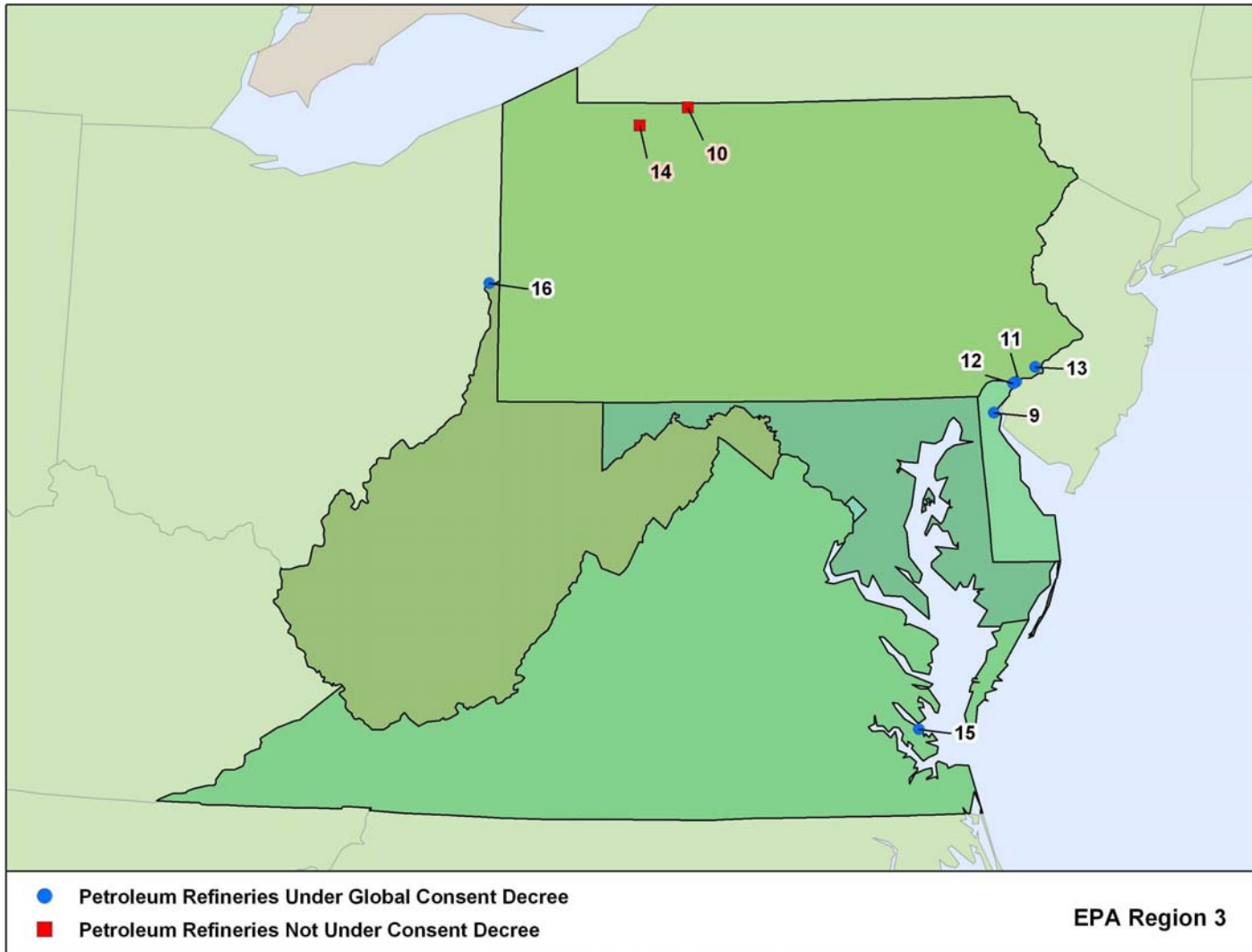
By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)

Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005, except:

1. NPRA Refining Capacity Report 2005
2. January 2006 EIA Petroleum Profile for New Jersey
3. Citgo press release dated 11/28/2004



# Region 3 Petroleum Refineries



# Region 3 Petroleum Refineries

## Refineries under CD

### Delaware

9. Valero Energy Corp.– Delaware City –  
190,000

### Pennsylvania

11. ConocoPhillips – Trainer – 185,000  
12. Sunoco Inc.– Marcus Hook – 175,000  
13. Sunoco Inc. – Philadelphia – 330,000

### Virginia

15. Giant Refining Company – Yorktown –  
58,900

### West Virginia

16. Ergon-West Virginia, Inc. – Newell –  
19,400

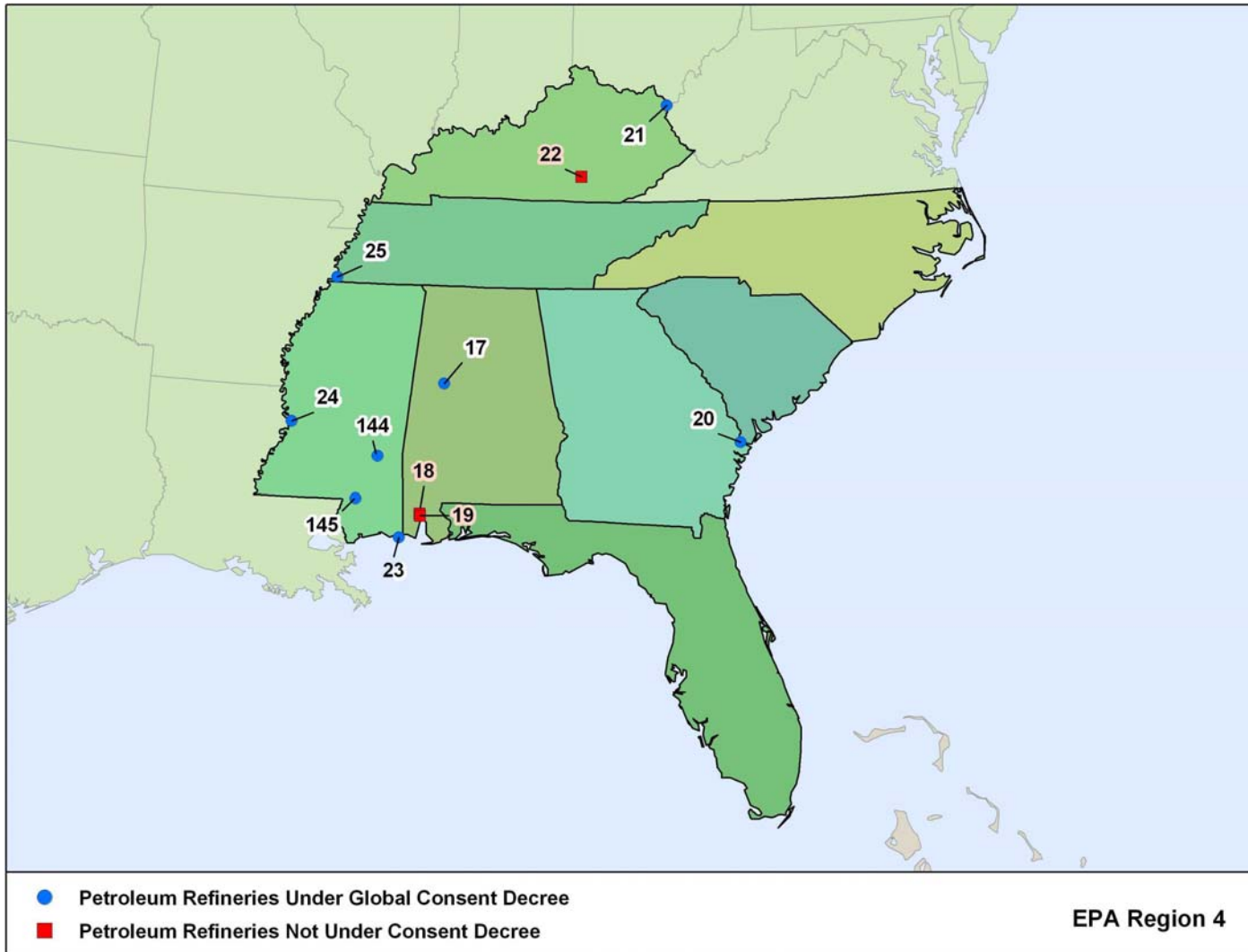
## Refineries not under CD

### Pennsylvania

10. American Refining Group – Bradford –  
10,000  
14. United Refining Co. – Warren – 66,700

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)  
Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005

# Region 4 Petroleum Refineries



# Region 4 Petroleum Refineries

## Refineries under CD

### Alabama

17. Hunt Refining Company – Tuscaloosa – 43,225

### Georgia

20. Citgo Asphalt Refining Co. – Savannah – 28,000

### Kentucky

21. Marathon Petroleum Company LLC – Catlettsburg – 222,000

### Mississippi

23. Chevron Corp. – Pascagoula – 325,000

24. Ergon Refining Inc. – Vicksburg – 23,000

144, 145. Hunt Southland Refining Company – Sandersville and Lumberton – 43,225

### Tennessee

25. Valero Energy Corp. – Memphis – 190,000

## Refineries not under CD

### Alabama

18. Shell Chemical Company – Saraland – 85,000

19. Trigeant Petroleum – Mobile Bay – 20,000

### Kentucky

22. Somerset Refinery Inc. – Somerset – 5,500

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)

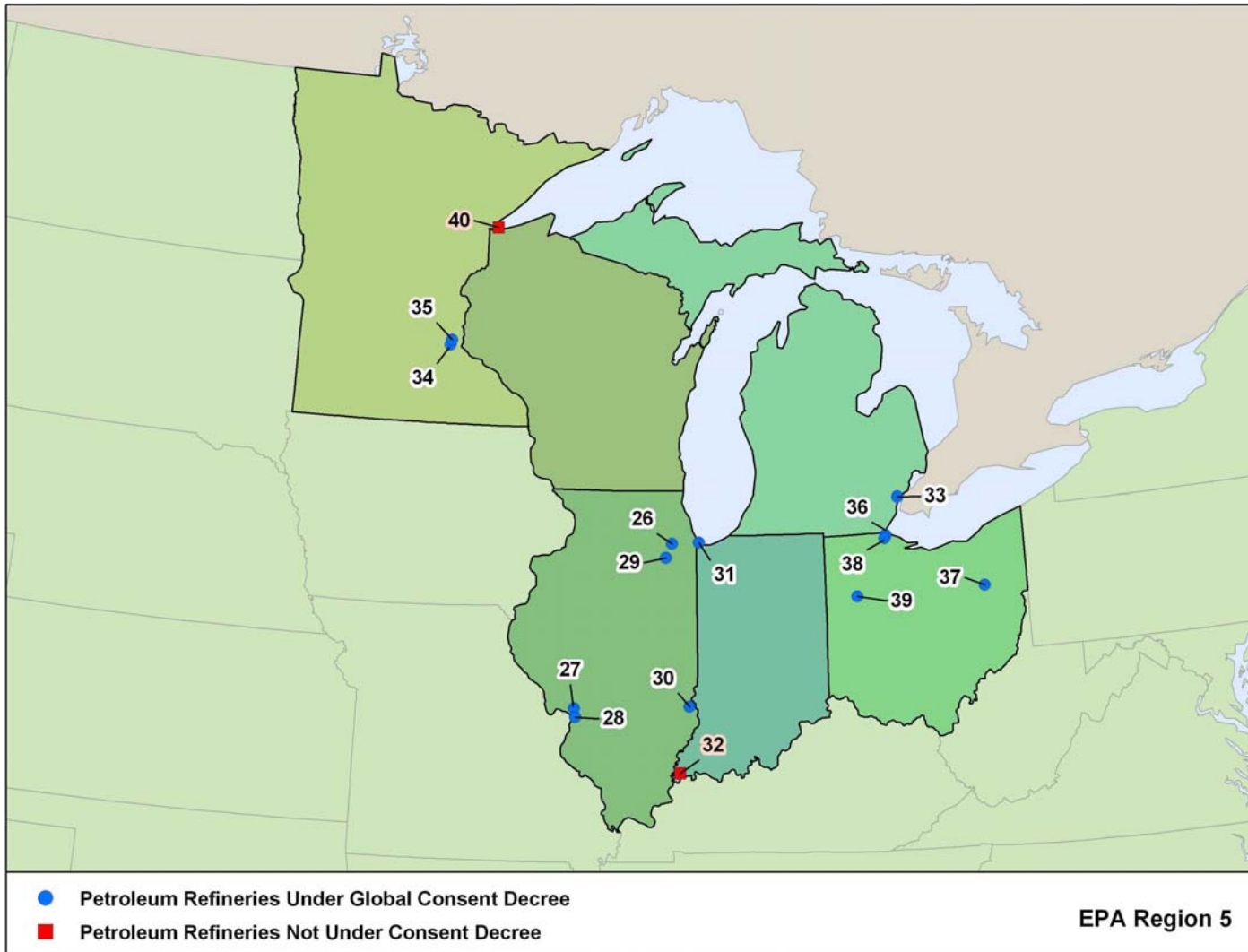
Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005, except:

20. Citgo press release dated 11/28/2004

144 & 145. Hunt press release dated 9/28/2007

Draft 2/5/08 - Subject to Revision

# Region 5 Petroleum Refineries



# Region 5 Petroleum Refineries

## Refineries under CD

### Illinois

- 26. Citgo Petroleum Corp. – Lemont – 158,650
- 27, 28. ConocoPhillips – Wood River and Distilling West – 306,000
- 29. ExxonMobil Refining and Supply Co. – Joliet – 238,000
- 30. Marathon Petroleum Company LLC – Robinson – 192,000

### Indiana

- 31. BP PLC – Whiting – 399,000

### Michigan

- 33. Marathon Petroleum Company LLC – Detroit – 100,000

### Minnesota

- 34. Flint Hills Resources – Pine Bend – 279,300
- 35. Marathon Petroleum Company LLC – St. Paul Park – 70,000

### Ohio

- 36. BP PLC – Toldeo – 147,250
- 37. Marathon Petroleum Company LLC – Canton – 73,000
- 38. Sunoco Inc. – Toledo – 140,000
- 39. Valero Energy Corp. – Lima – 161,500

## Refineries not under CD

### Indiana

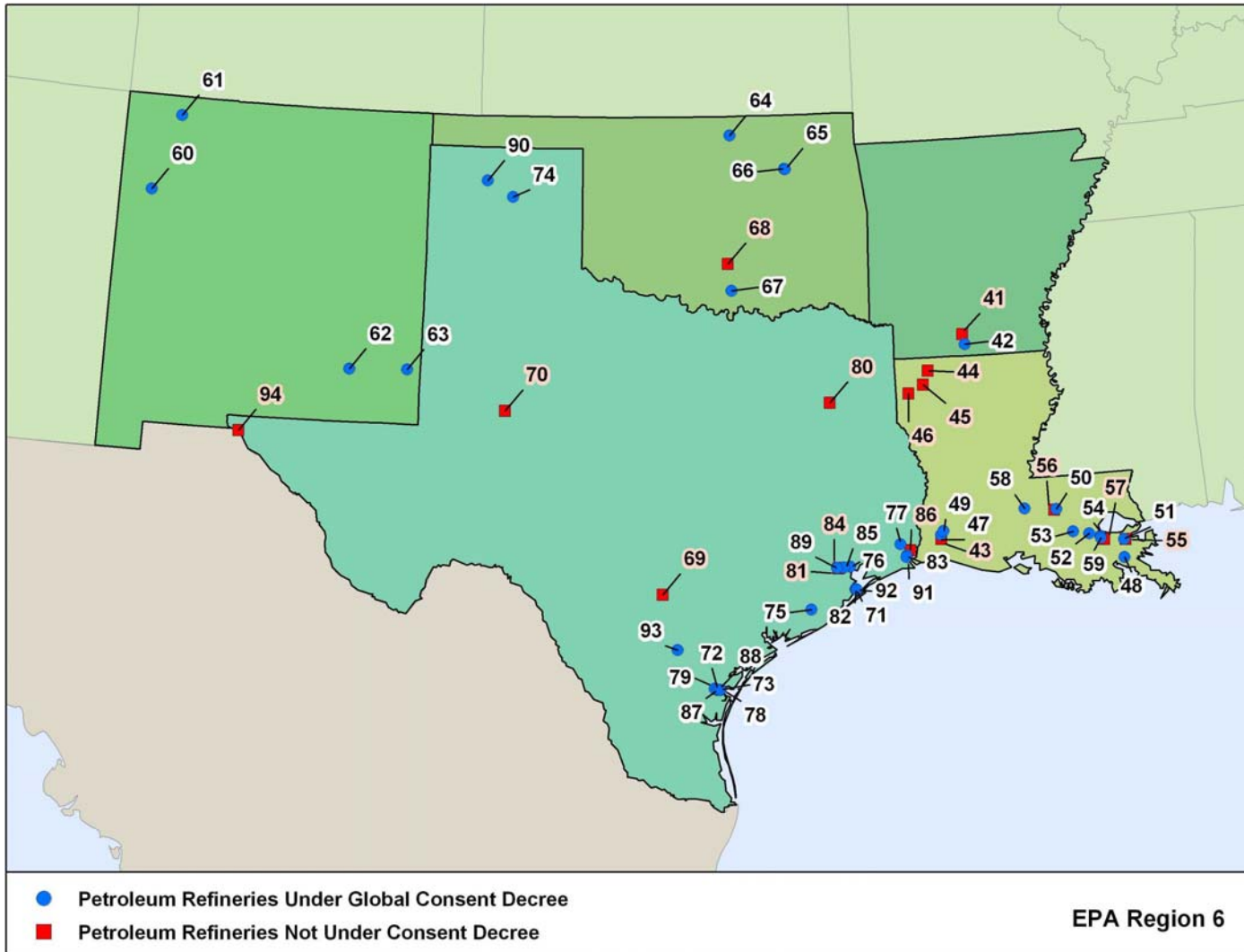
- 32. Countrymark Cooperative Inc. – Mount Vernon – 23,500

### Wisconsin

- 40. Murphy Oil USA Inc. – Superior – 33,250

By state: Number on map, Company, Refinery,  
Crude oil capacity (barrels/day)  
Data from Oil & Gas Journal's 2005 Worldwide  
Refining Survey, December 19, 2005

# Region 6 Petroleum Refineries



# Region 6 Petroleum Refineries

## Refineries under CD

### Arkansas

42. Lion Oil Company – El Dorado – 70,000

### Louisiana

- 47. Citgo Petroleum Corp. – Lake Charles – 440,000
- 48. ConocoPhillips – Alliance – 247,000
- 49. ConocoPhillips – Lake Charles – 239,000
- 50. ExxonMobil Refining and Supply Co. – Baton Rouge – 501,000
- 51. ExxonMobil Refining and Supply Co. – Chalmette – 188,000
- 52. Marathon Petroleum Company LLC – Garyville – 245,000
- 53. Motiva Enterprises LLC – Convent – 235,000
- 54. Motiva Enterprises LLC – Norco – 220,000
- 58. Valero Energy Corp. – Krotz Springs – 83,100
- 59. Valero Energy Corp. – St. Charles – 186,000

### New Mexico

- 60. Giant Refining Company – Ciniza – 26,000
- 61. Giant Refining Company – Bloomfield – 18,600
- 62, 63. Navajo Refining Company – Artesia and Lovington – 60,000

### Oklahoma

- 64. ConocoPhillips – Ponca City – 187,000
- 66. Sunoco Inc. – Tulsa – 85,000
- 67. Valero Energy Corp. – Ardmore – 87,877
- 65. Sinclair Oil Corp. – Tulsa – 50,000

### Texas

- 71. BP PLC – Texas City – 446,500
- 72, 73. Citgo Petroleum Corp. – Corpus Christi East and West Plants – 156,750
- 74. ConocoPhillips – Borger – 146,000
- 75. ConocoPhillips – Sweeny – 247,000
- 76. ExxonMobil Refining and Supply Co. – Baytown – 563,000
- 77. ExxonMobil Refining and Supply Co. – Beaumont – 348,500
- 78, 79. Flint Hills Resources – Corpus Christi East and West Plants – 279,300
- 82. Marathon Petroleum Company LLC – Texas City – 72,000
- 83. Motiva Enterprises LLC – Port Arthur – 285,000
- 85. Shell Deer Park Refining Co. – 333,700
- 86. Total SA – Port Arthur – 231,252
- 87, 88. Valero Energy Corp. – Corpus Christi East and West Plants – 205,000
- 89. Valero Energy Corp. – Houston – 90,000
- 90. Valero Energy Corp. – McKee – 166,660
- 91. Valero Energy Corp. – Port Arthur – 250,000
- 92. Valero Energy Corp. – Texas City – 225,000
- 93. Valero Energy Corp. – Three Rivers – 96,000



# Region 6 Petroleum Refineries

## Refineries not under CD

### Arkansas

41. Cross Oil and Refining Company –  
Smackover – 7,000

### Louisiana

43. Calcasieu Refining Co. – Lake Charles –  
15,680

44. Calumet Lubricants Co. – Cotton Valley –  
9,500

45. Calumet Lubricants Co. – Princeton – 9,500

46. Calumet Lubricants Co. – Shreveport –  
35,000

55. Murphy Oil USA Inc. – Meraux – 125,000

56. Placid Refining Co. LLC – Port Allen –  
55,000

57. Shell Chemical Company – St. Rose –  
55,000

### Oklahoma

68. Wynnewood Refining Co. – Wynnewood –  
52,500

### Texas

69. AGE Refining And Manufacturing – San  
Antonion – 12,000

70. Alon USA – Big Spring – 70,000

80. LaGloria Oil and Gas Co. – Tyler – 60,000

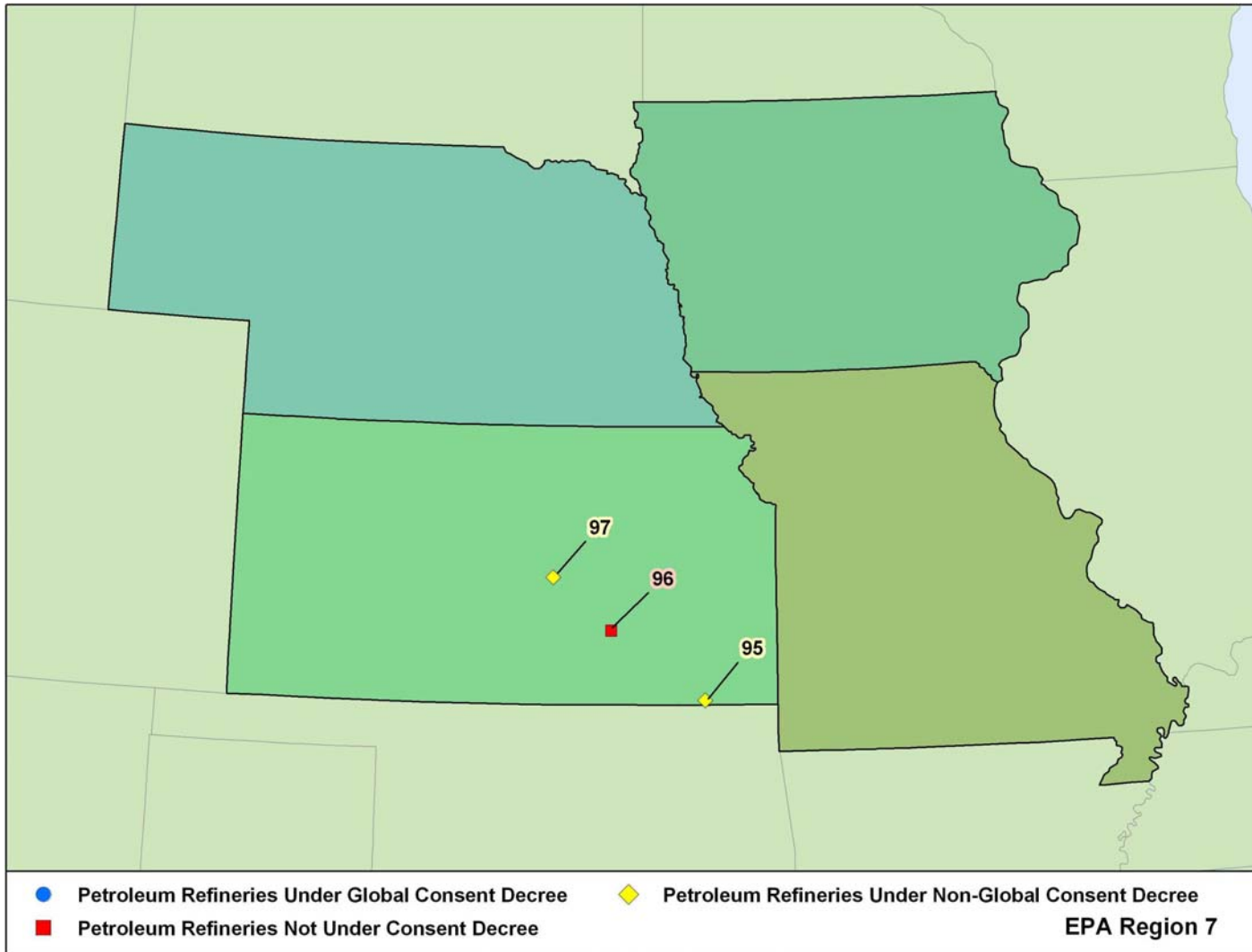
81. Lyondell-Citgo Refining LP – Houston –  
282,600

84. Pasadena Refining System – 100,000

94. Western Refining Inc. – El Paso – 90,000

By state: Number on map, Company, Refinery,  
Crude oil capacity (barrels/day)  
Data from Oil & Gas Journal's 2005 Worldwide  
Refining Survey, December 19, 2005

# Region 7 Petroleum Refineries



# Region 7 Petroleum Refineries

## Refineries under global CD

None

## Refineries not under CD

Kansas

96. Frontier – El Dorado – 110,000

## Refineries under non-global CD

Kansas

95. Coffeyville Resources Refining & Marketing – Coffeyville – 100,000

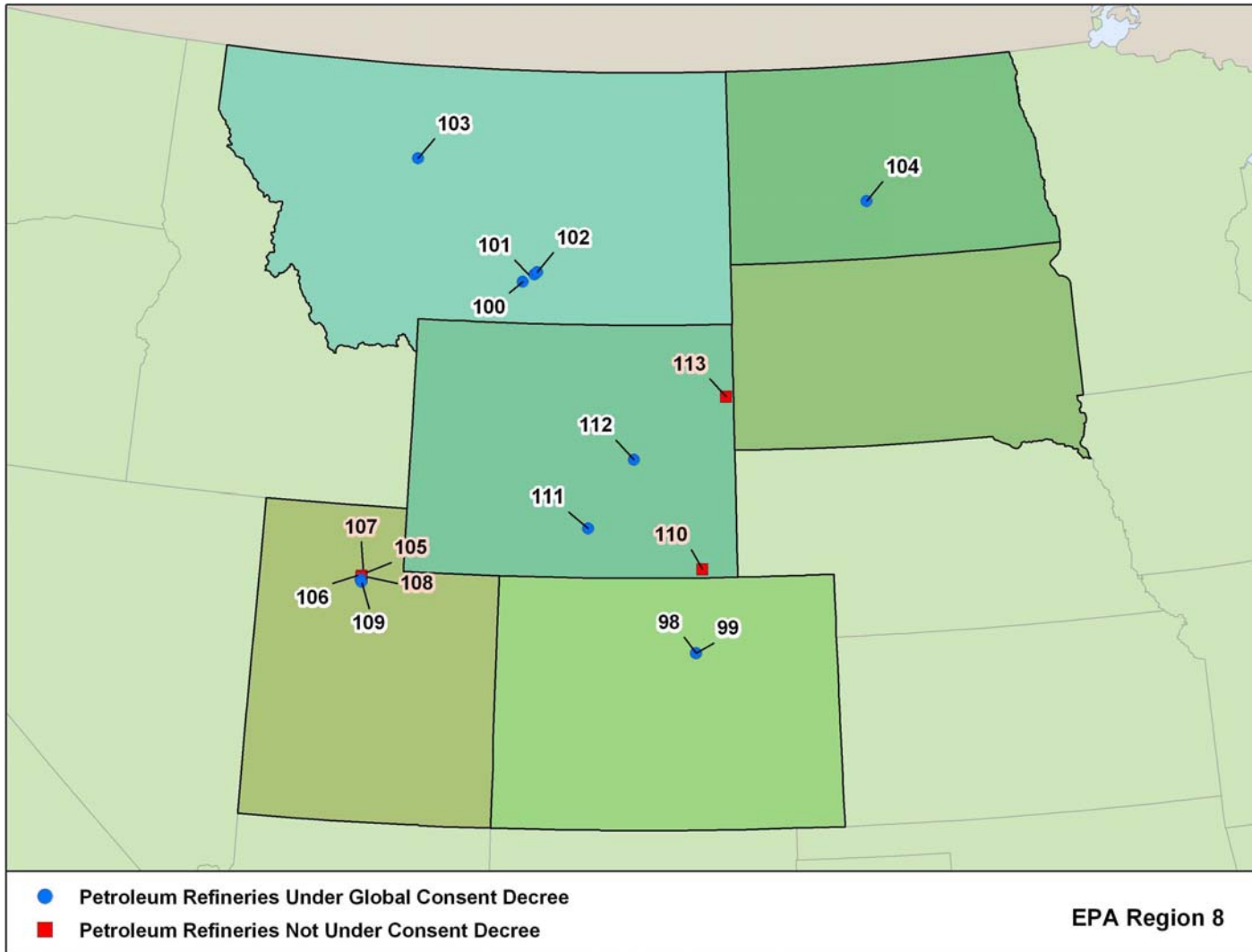
97. National Cooperative Refining Association – McPherson – 82,200

### *Note:*

Coffeyville Resources Refining & Marketing and National Cooperative Refining Association are both under consent decrees with the United States and the State of Kansas that cover some, but not all, of the marquee issues of the National Petroleum Refinery Initiative.

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)  
Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005

# Region 8 Petroleum Refineries



# Region 8 Petroleum Refineries

## Refineries under CD

### Colorado

- 98. Suncor Energy Products – Denver West Plant – 92,000
- 99. Suncor Energy Products – Denver East Plant – 28,000

### Montana

- 100. Cenex Harvest States – Laurel – 57,500
- 101. ConocoPhillips – Billings – 58,000
- 102. ExxonMobil Refining and Supply Co. – Billings – 60,000
- 103. Montana Refining Company – Great Falls – 8,200

### North Dakota

- 104. Tesoro West Coast Co. – Mandan – 58,000

### Utah

- 106. Chevron Corp. – Salt Lake City – 45,000
- 109. Tesoro West Coast Co. – Salt Lake City – 60,000

### Wyoming

- 111. Sinclair Oil Corp. – Sinclair – 22,000
- 112. Sinclair/Little America – Casper – 22,500

## Refineries not under CD

### Utah

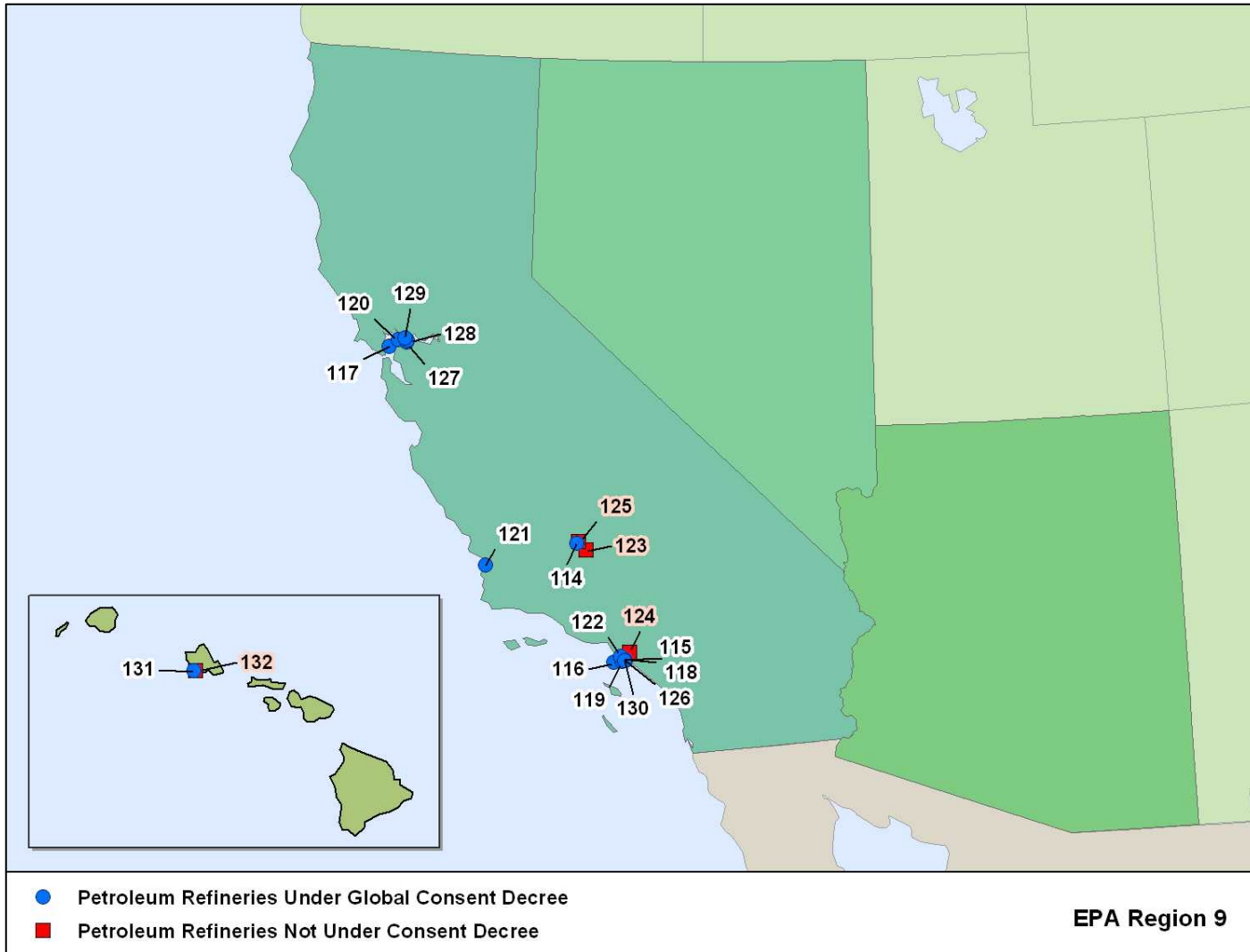
- 105. Big West Oil LLC – Salt Lake City – 25,000
- 107. Holly Corporation – Woods Cross – 25,000
- 108. Silver Eagle Refining Inc. – Woods Cross – 12,500

### Wyoming

- 110. Frontier Refining Inc. – Cheyenne – 46,000
- 113. Wyoming Refining Co. – Newcastle – 12,500

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)  
Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005

# Region 9 Petroleum Refineries



# Region 9 Petroleum Refineries

## Refineries under CD

### California

- 114. Big West Oil LLC – Bakersfield – 65,000
- 115. BP PLC – Carson – 247,000
- 116. Chevron Corp. – El Segundo – 260,000
- 117. Chevron Corp. – Richmond – 225,000
- 118, 119. ConocoPhillips – LAR-Carson and Wilmington – 138,700
- 120, 121. ConocoPhillips – SF-Rodeo and Santa Maria – 120,000
- 122. ExxonMobil Refining and Supply Co. – Torrance – 149,500
- 126. Shell Oil Products US – Los Angeles – 100,000
- 127. Shell Oil Products US – Martinez – 157,600
- 128. Tesoro Corp. – Golden Eagle – 161,000
- 129. Valero Energy Corp. – Benicia – 139,500
- 130. Valero Energy Corp. – Wilmington – 80,000

### Hawaii

- 131. Chevron Corp. – Hawaii – 54,000

## Refineries not under CD

### California

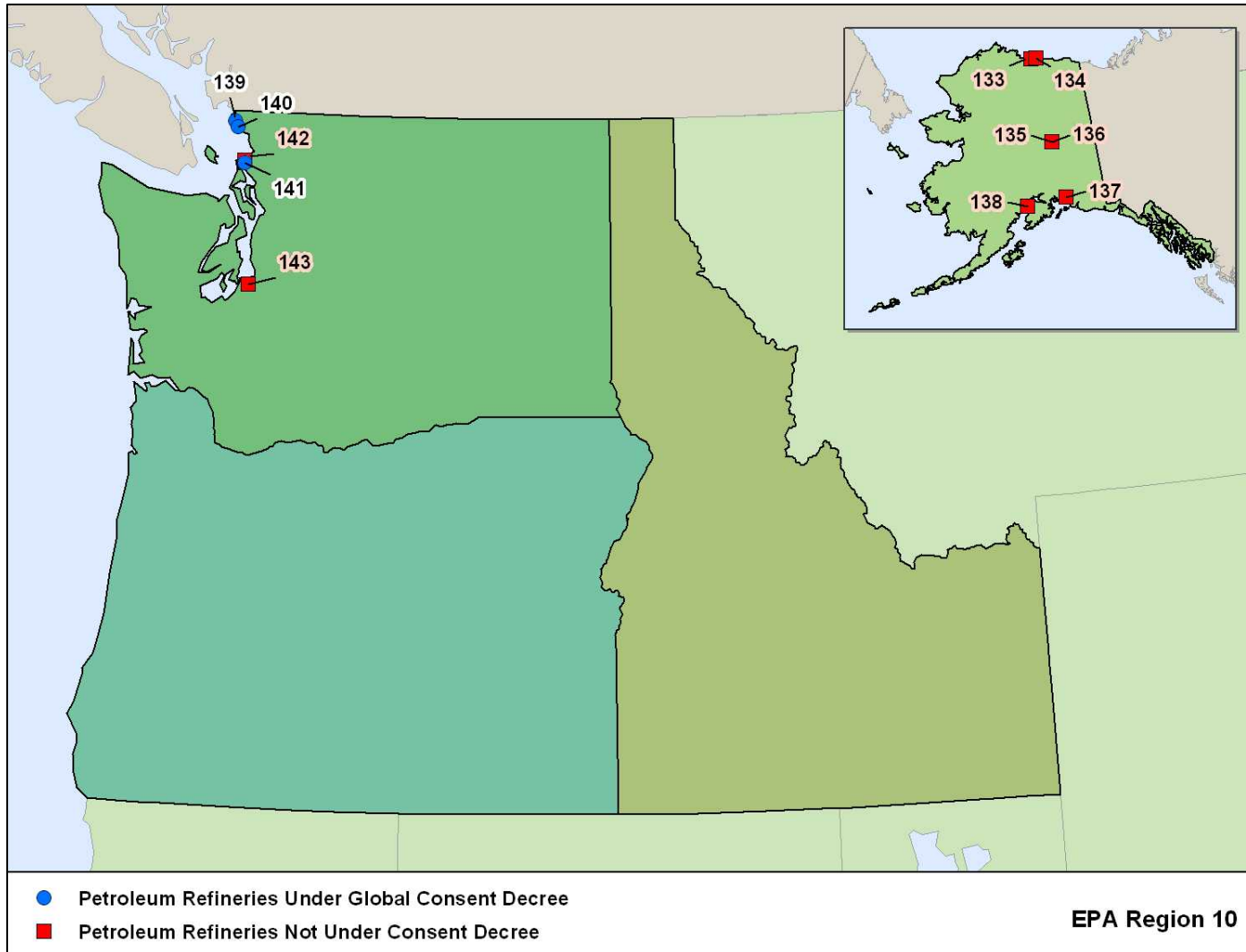
- 123. Kern Oil and Refining Co. – Bakersfield – 25,000
- 124. Paramount Petroleum Corp. – Long Beach – 52,000
- 125. San Joaquin Refining Co., Inc. – Bakersfield – 24,300

### Hawaii

- 132. Tesoro Hawaii Corp. – Hawaii – 93,700

By state: Number on map, Company, Refinery, Crude oil capacity (barrels/day)  
Data from Oil & Gas Journal's 2005 Worldwide Refining Survey, December 19, 2005

# Region 10 Petroleum Refineries





# Region 10 Petroleum Refineries

## Refineries under CD

### Washington

- 139. BP PLC – Cherry Point – 220,400
- 140. ConocoPhillips – Ferndale – 96,000
- 141. Shell Oil Products US – Puget Sound – 148,600

## Refineries not under CD

### Alaska

- 133. BP PLC – Kuparuk – 14,500
- 134. BP PLC – Prudhoe Bay – 15,000
- 135. Flint Hills Resources – North Pole – 215,175
- 136. Petro Star Inc. – North Pole – 17,500
- 137. Petro Star Inc. – Valdez – 48,000
- 138. Tesoro Alaska Company – Kenai – 72,000

### Washington

- 142. Tesoro West Coast Co. – Anacortes – 113,300
- 143. US Oil and Refining Co. – Tacoma – 35,800

By state: Number on map, Company, Refinery,  
Crude oil capacity (barrels/day)  
Data from Oil & Gas Journal's 2005 Worldwide  
Refining Survey, December 19, 2005



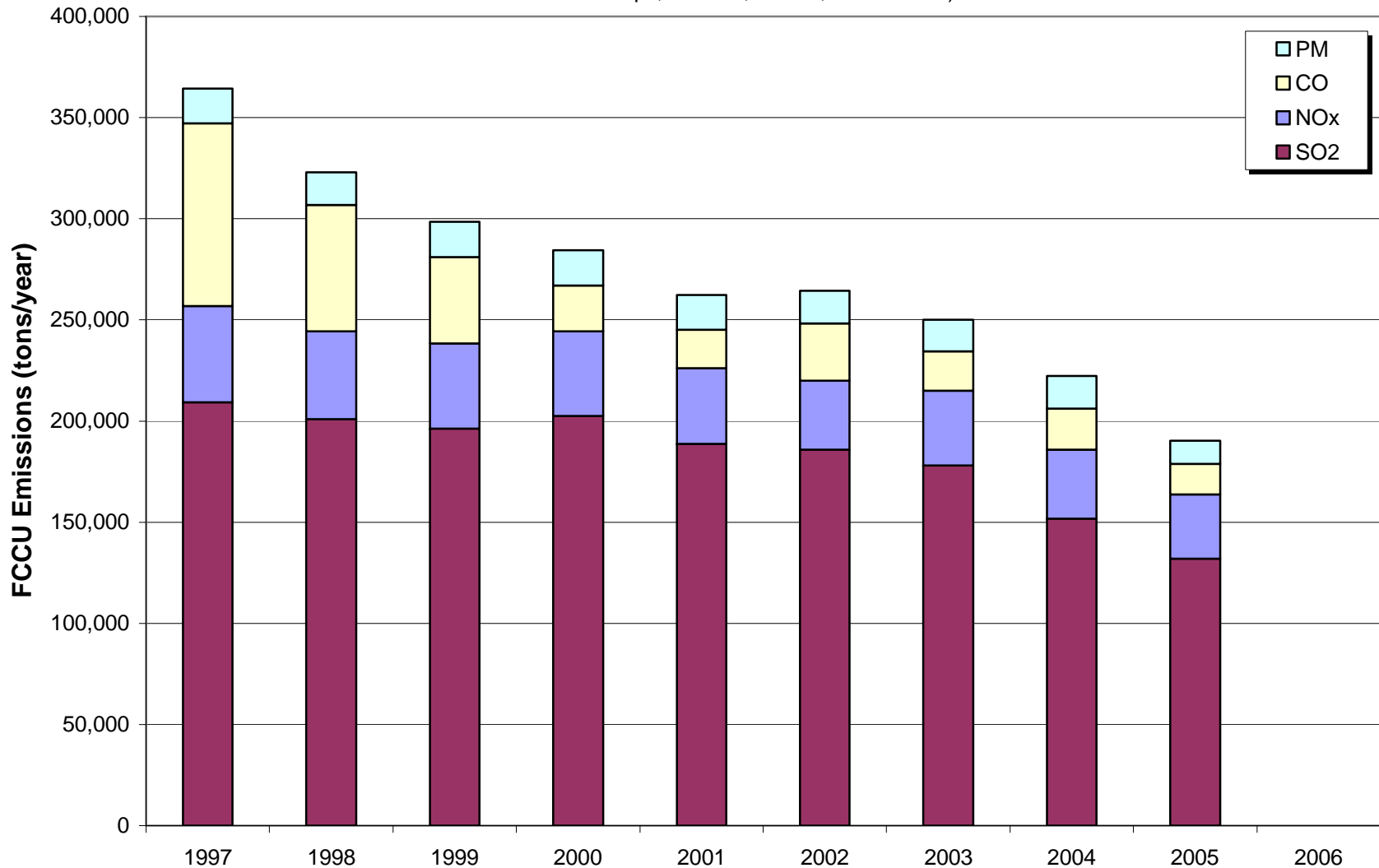
# Petroleum Refinery Initiative

## Actual Emissions Reductions from Settling Refiners under Consent Decrees

(Entered as of June 1, 2006)

## Actual FCCU Emissions from Refineries Under Consent Decrees

(Koch, BP, Motiva-Equilon-Deer Park, Marathon, Conoco, Navajo-Montana, Lion, CHS, Coastal, Chevron, CITGO, ConocoPhillips, Sunoco, Valero, ExxonMobil)



Note: Emissions data for FCCUs under the Total Petroleum CD were not available at the time of this update.

## Actual FCCU SO<sub>2</sub> Emissions from Refineries Under Consent Decrees

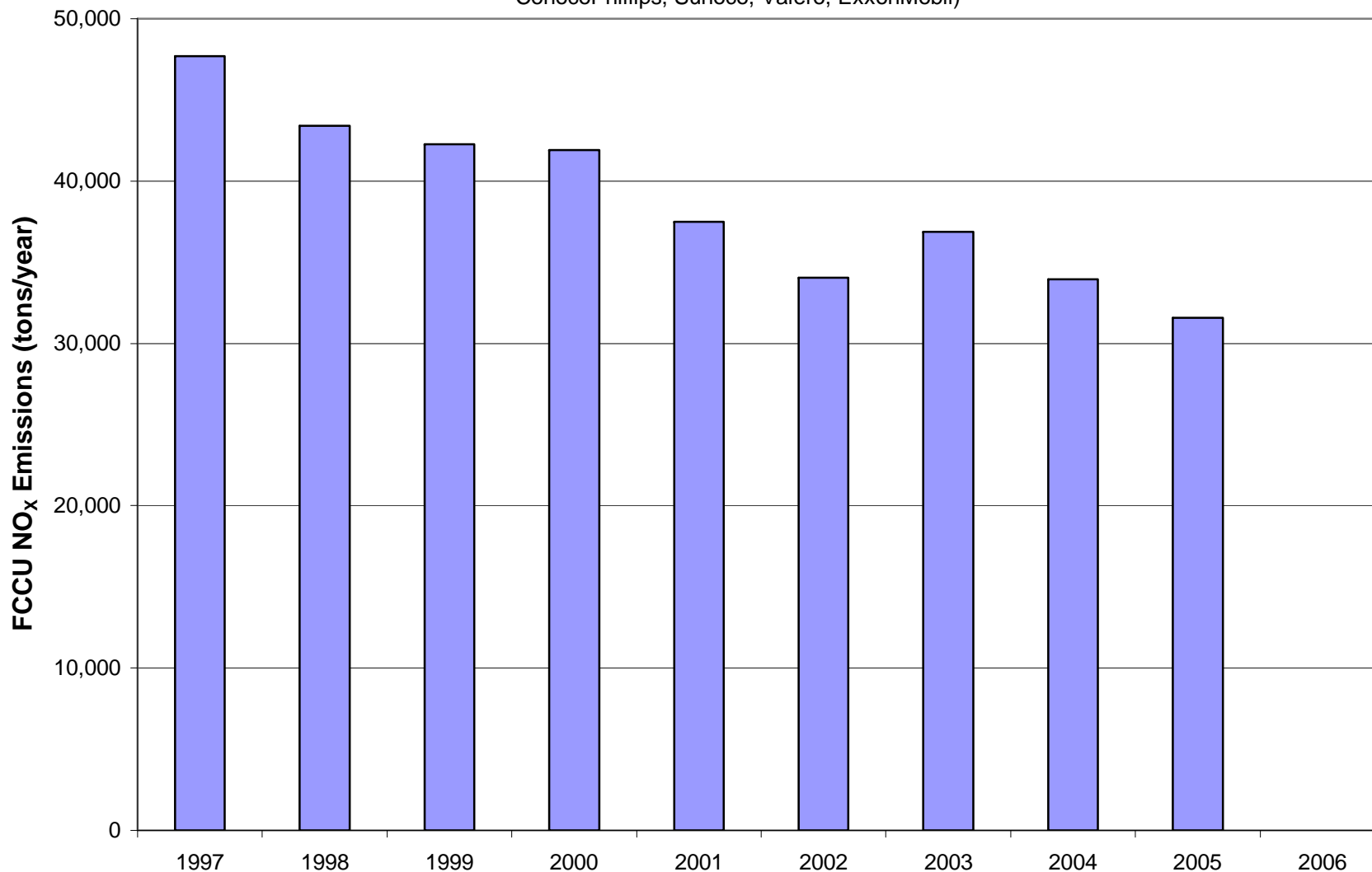
(Koch, BP, Motiva-Equilon-Deer Park, Marathon, Conoco, Navajo-Montana, Lion, CHS, Coastal, Chevron, CITGO, ConocoPhillips, Sunoco, Valero, ExxonMobil)



Note: Emissions data for FCCUs under the Total Petroleum CD were not available at the time of this update.

## Actual FCCU NO<sub>x</sub> Emissions from Refineries Under Consent Decrees

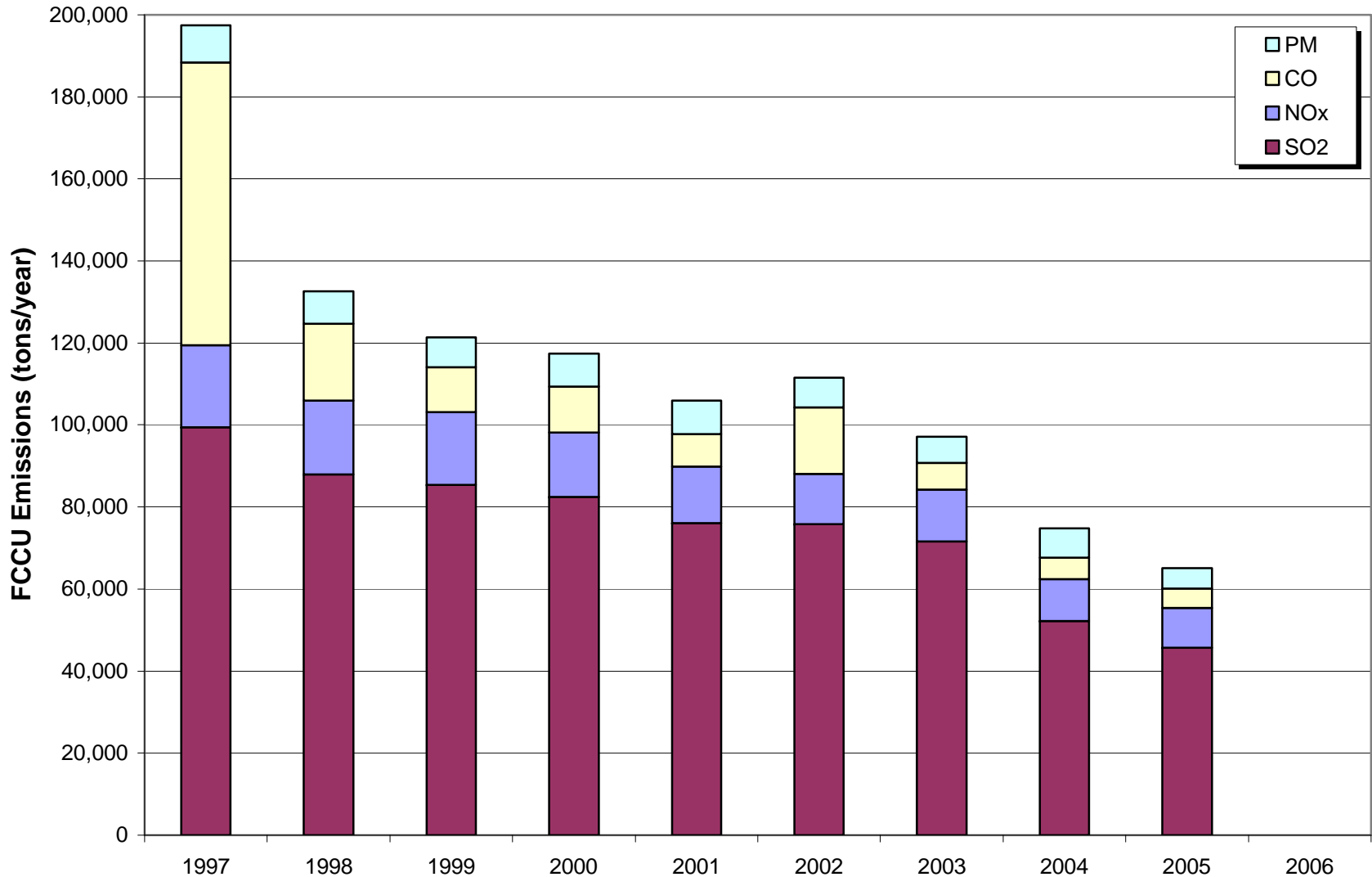
(Koch, BP, Motiva-Equilon-Deer Park, Marathon, Conoco, Navajo-Montana, Lion, CHS, Coastal, Chevron, CITGO, ConocoPhillips, Sunoco, Valero, ExxonMobil)



Note: Emissions data for FCCUs under the Total Petroleum CD were not available at the time of this update.

# Actual FCCU Emissions from Refineries Under Early Consent Decrees

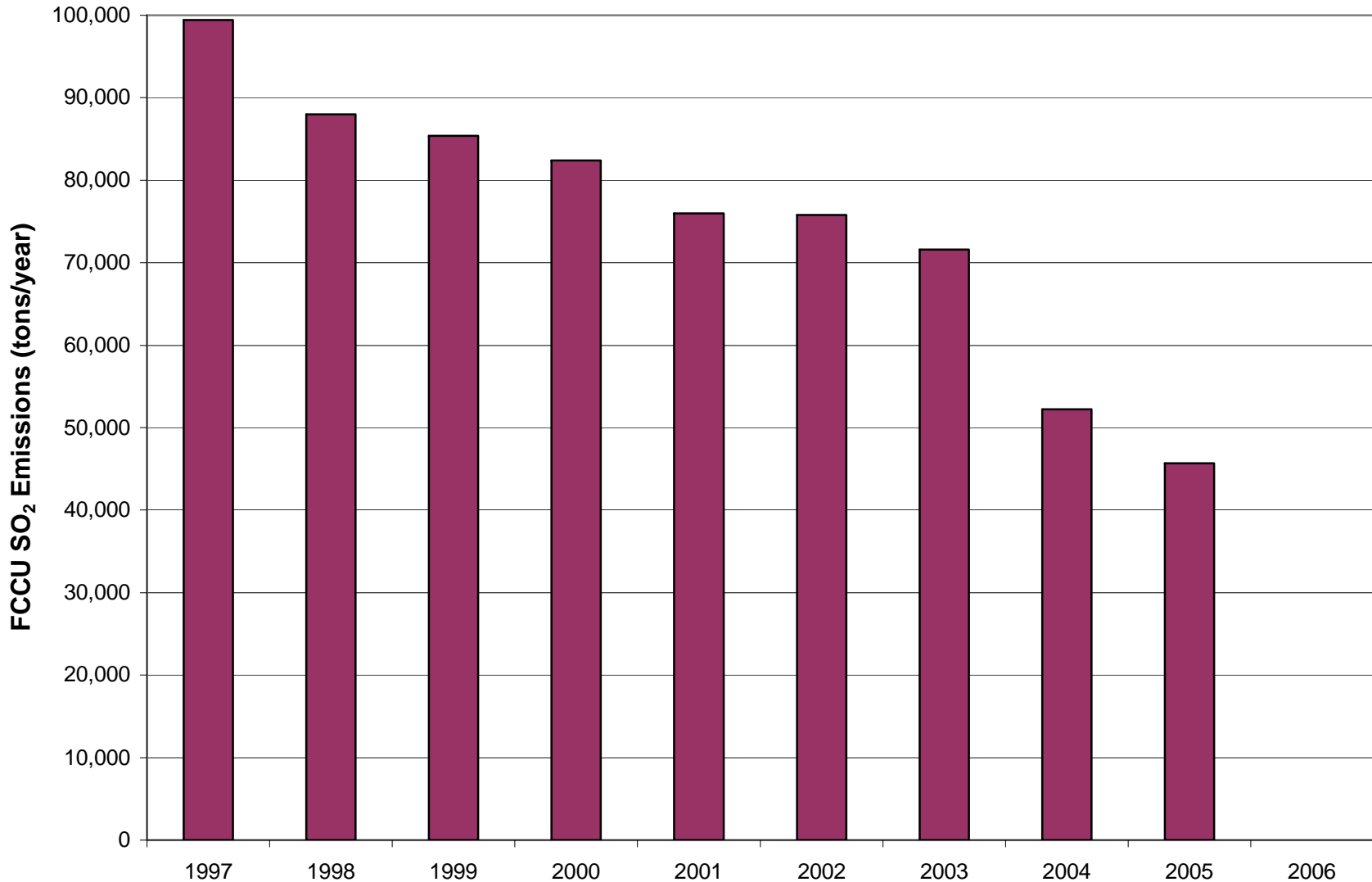
(Koch, BP, Motiva-Equilon-Deer Park, Marathon, Conoco, Navajo-Montana, Lion, CHS, Coastal)



**Note: The early consenters are further along in the CD implementation process and better represent projected emissions reductions than the more recent consenters who are in the early stages of CD implementation.**

## Actual FCCU SO<sub>2</sub> Emissions from Refineries Under Early Consent Decrees

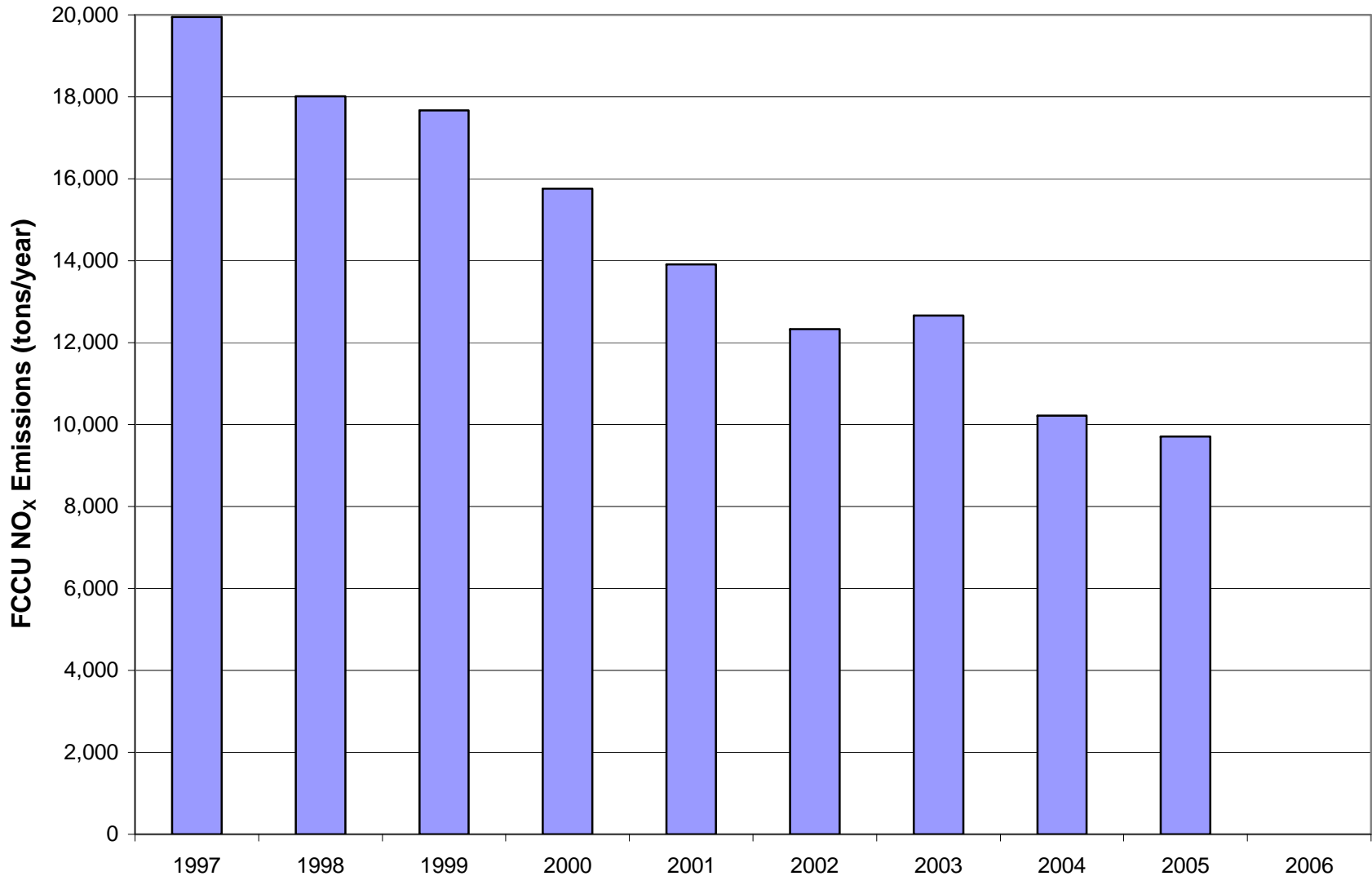
(Koch, BP, Motiva-Equilon-Deer Park, Marathon, Conoco, Navajo-Montana, Lion, CHS, Coastal)



**Note: The early consenters are further along in the CD implementation process and better represent projected emissions reductions than the more recent consenters who are in the early stages of CD implementation.**

## Actual FCCU NO<sub>x</sub> Emissions from Refineries Under Early Consent Decrees

(Koch, BP, Motiva-Equilon-Deer Park, Marathon, Conoco, Navajo-Montana, Lion, CHS, Coastal)

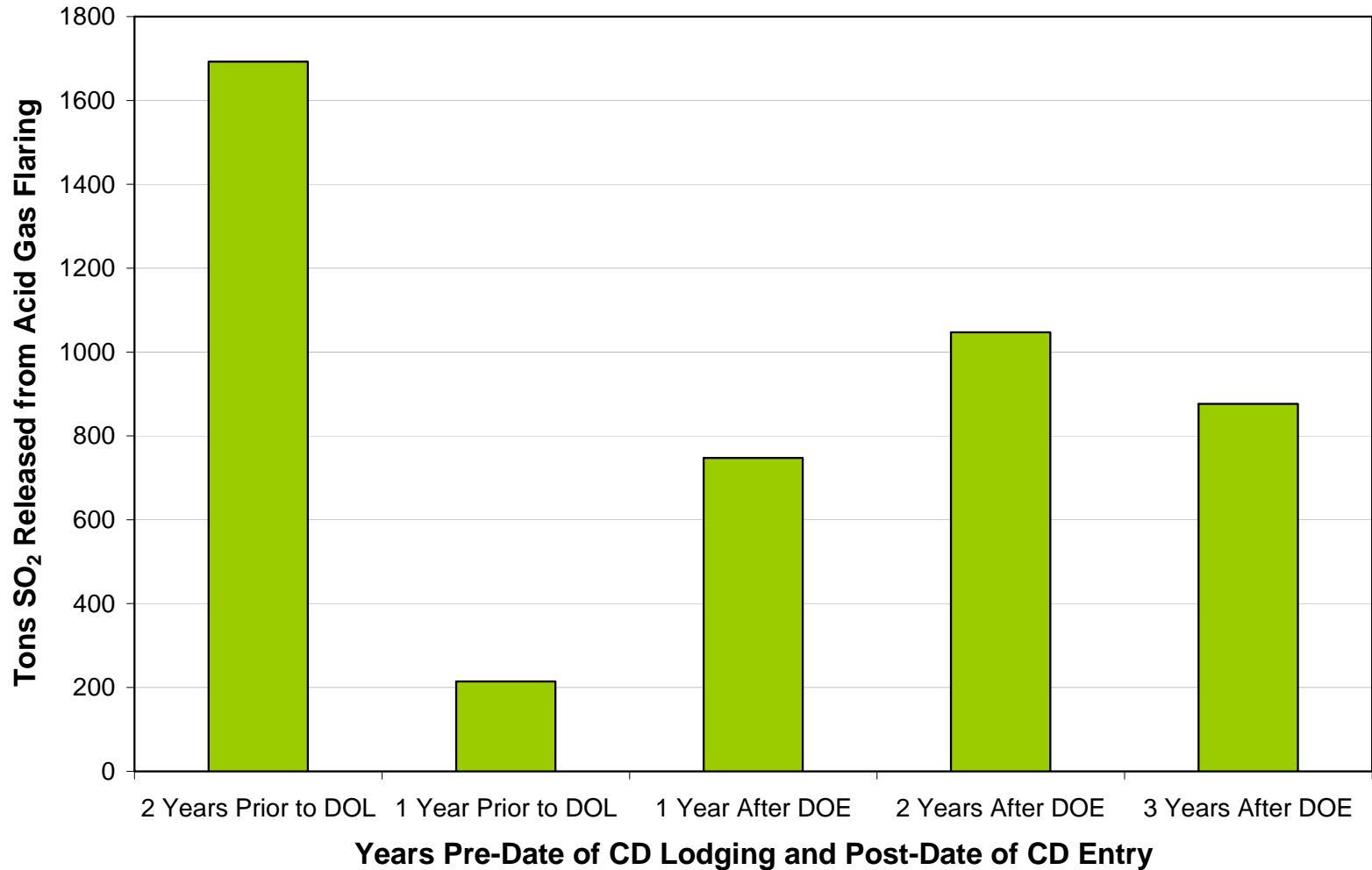


**Note: The early consenters are further along in the CD implementation process and better represent projected emissions reductions than the more recent consenters who are in the early stages of CD implementation.**



# Reductions in SO<sub>2</sub> from Flaring

(Koch, BP, Motiva-Equilon-Deer Park, Marathon, Conoco, and CHS Consent Decrees)



Note: The CDs presented provided flaring reports prior to the CD lodging and have completed three full years after CD entry.



# Petroleum Refinery Initiative

Schedule for Installation of Controls:

All Refiners

(Decreases entered as of June 1, 2006)

# Fluidized Catalytic Cracking Unit (FCCU) Emissions Reduction Compliance Dates

|             |                      | 2001 | 2002 | 2003 | 2004 | 2005             | 2006    | 2007             | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-------------|----------------------|------|------|------|------|------------------|---------|------------------|------|------|------|------|------|------|------|------|
| Flint Hills | DOL Dec 2000         |      |      |      |      |                  |         |                  |      |      |      |      |      |      |      |      |
|             | FCCU SO <sub>2</sub> |      | 2 ■  | ■    |      |                  |         |                  |      |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      | ▲    |      |      | ▲                | ▲       |                  | ▲    |      |      | ▲▲   |      |      |      |      |
| BP          | DOL Jan 2001         |      |      |      |      |                  |         |                  |      |      |      |      |      |      |      |      |
|             | FCCU SO <sub>2</sub> | ■    |      |      | ■ ■  | 3 ■ <sup>1</sup> | 4 ■     |                  |      |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      | 3 ▲ <sup>2</sup> | ▲       | 2 ▲              | ▲    |      |      |      |      |      |      |      |
| M-E-DP      | DOL Mar 2001         |      |      |      |      |                  |         |                  |      |      |      |      |      |      |      |      |
|             | FCCU SO <sub>2</sub> | 2 ■  |      | ■    |      | ■                | ■       | 2 ■              | ■    |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      | ▲    | 2 ▲              | ▲ ▲ ▲ ▲ | 2 ▲              |      |      |      |      |      |      |      |      |
| MAP         | DOL May 2001         |      |      |      |      |                  |         |                  |      |      |      |      |      |      |      |      |
|             | FCCU SO <sub>2</sub> | 2 ■  |      |      | ■ ■  | ■                | ■       | 2 ■              |      |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      | ▲    |                  | 4 ▲ ▲   | ▲                | ▲    |      |      |      |      | ▲    |      |      |
| Conoco      | DOL Dec 2001         |      |      |      |      |                  |         |                  |      |      |      |      |      |      |      |      |
|             | FCCU SO <sub>2</sub> |      |      |      |      | ■ ■              | ■       | ■                | ■ ■  | ■    |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      | ▲                |         | ▲ <sup>3</sup> ▲ | ▲    |      |      |      |      | ▲    |      |      |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, ◻ = hardware installation, ■ = hardware limits effective, ◻ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: ▲ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:  
<sup>1</sup>BP Carson, Texas City FCCU 1, Texas City FCCU 2: Compliance date for SO2 final limits is date of entry of Fourth Amendment to the Consent Decree, October 7, 2005.  
<sup>2</sup>BP Carson, Texas City FCCU 1, Whiting FCU 600: Compliance date for NOx final limits is date of entry of Fourth Amendment to the Consent Decree, October 7, 2005.  
<sup>3</sup>Ponca City 5: NOx reducing additive demonstration report provides interim NOx limits until the hardware limits are effective.

# FCCU Emissions Reduction Compliance Dates

|                  |                      | 2001 | 2002         | 2003         | 2004         | 2005 | 2006 | 2007           | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |  |
|------------------|----------------------|------|--------------|--------------|--------------|------|------|----------------|------|------|------|------|------|------|------|------|--|
| Montana          | DOL Dec 2001         |      |              |              |              |      |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU SO <sub>2</sub> |      | [Yellow bar] |              |              |      | ■    |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU NO <sub>x</sub> |      | [Yellow bar] |              |              |      | ▲    |                |      |      |      |      |      |      |      |      |  |
| Navajo           | DOL Dec 2001         |      |              |              |              |      |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU SO <sub>2</sub> |      | [Yellow bar] |              | ■            |      |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU NO <sub>x</sub> |      | [Yellow bar] |              |              |      | ▲    |                |      |      |      |      |      |      |      |      |  |
| Lion Oil         | DOL Mar 2003         |      |              |              |              |      |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU SO <sub>2</sub> |      |              | [Yellow bar] |              | ■    |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU NO <sub>x</sub> |      | [Yellow bar] |              |              |      |      |                |      |      | ▲    |      |      |      |      |      |  |
| Chevron          | DOL Oct 2003         |      |              |              |              |      |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU SO <sub>2</sub> |      |              | [Yellow bar] |              |      |      | ■              | ■    | ■    | ■    | ■    | ■    |      |      |      |  |
|                  | FCCU NO <sub>x</sub> |      |              | ▲            | [Yellow bar] |      |      |                |      |      |      | ▲    | ▲    | ▲    | ▲    |      |  |
| Sunoco (Coastal) | DOL Oct 2003         |      |              |              |              |      |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU SO <sub>2</sub> |      |              | ■            |              |      |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU NO <sub>x</sub> |      | [Yellow bar] |              |              |      |      |                |      |      | ▲/▲  |      |      |      |      |      |  |
| CHS              | DOL Oct 2003         |      |              |              |              |      |      |                |      |      |      |      |      |      |      |      |  |
|                  | FCCU SO <sub>2</sub> |      |              | [Yellow bar] |              |      |      | ■ <sup>2</sup> |      |      |      |      |      |      |      |      |  |
|                  | FCCU NO <sub>x</sub> |      | [Yellow bar] |              |              |      | ▲    |                |      |      |      |      |      |      |      |      |  |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: ▲ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:  
<sup>1</sup>Chevron Salt Lake City: If WGS is installed, compliance date is 3/2012; if WGS is not installed, compliance date is 9/2010.  
<sup>2</sup>CHS Laurel: If WGS is installed, compliance date is 12/2009; if WGS is not installed, compliance date is 12/2007.

# FCCU Emissions Reduction Compliance Dates

|                       |                      | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-----------------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| CITGO                 | DOL Oct 2004         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                       | FCCU SO <sub>2</sub> |      |      |      |      | ■    | ■    | 2 ■  |      |      | ■    |      | ■    |      | ■    |      |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |      |      | ▲    |      |      | 2 ▲  |      | ▲    | ▲    | ▲    |      |
| Conoco-Phillips       | DOL Jan 2005         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                       | FCCU SO <sub>2</sub> |      |      |      |      | 2 ■  | ■    | 2 ■  | ■    | ■    | ■    | ■    | ■    | ■    |      |      |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      | 2 ▲  | ▲    | ▲    | ▲    | 2 ▲  | ▲    | ▲    |
| Sunoco                | DOL Jun 2005         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                       | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      | ■    | ■    |      |      |      |      | ■    |      |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      | ▲    | ▲    |      |      |      |      | ▲    |      |
| Valero                | DOL Jun 2005         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                       | FCCU SO <sub>2</sub> |      |      |      |      | ■    | ■    | ■    | ■    |      | ■    | ■    | ■    | ■    | ■    |      |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |      | 2 ▲  | ▲    | 2 ▲  |      |      |      |      |      |      |      |
| ExxonMobil &Chalmette | DOL Oct 2005         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                       | FCCU SO <sub>2</sub> |      |      |      |      | 3 ■  | ■    | ■    | ■    | ■    | ■    | ■    | ■    | ■    |      |      |
|                       | FCCU NO <sub>x</sub> |      |      |      |      | ▲    |      | ▲    | 2 ▲  | ▲    | 2 ▲  |      |      | ▲    |      |      |
| Total                 | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      | 3 ■  |      |      |      |      |      |      |      |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      | ▲    |      |      |      |      |      |      |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, ◻ = hardware installation, ■ = hardware limits effective, ◻ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
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Footnotes:  
<sup>1</sup>ConocoPhillips Alliance: If SNERT is installed, compliance date is 3/2015; if SNERT is not installed, compliance date is 12/2009.  
<sup>2</sup>Chalmette: If additives are found to be effective, compliance date is 6/30/2007, if additives are not effective, compliance date is 12/31/2008.  
<sup>3</sup>Total Port Arthur: Compliance dates for SO<sub>2</sub> final limits are based on Date of Entry; timeline assumes Consent Decree will be entered by the second quarter 2008.

# FCCU Emissions Reduction Compliance Dates

|                  |                                   | Consent Decree Emissions Reduction Compliance Dates |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------|-----------------------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                  |                                   | 2001  | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Valero (Premcor) | DOL Aug 2007                      |   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                  | FCCU SO <sub>2</sub>              |   |      |      |      |      |      |      | □    |      |      | ■    |      |      |      |      |
|                  | FCCU NO <sub>x</sub> <sup>1</sup> |   |      |      |      |      |      |      | 2□   |      |      | △    |      |      |      | ▲    |
| Sinclair         | DOL Jan 2008                      |   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                  | FCCU SO <sub>2</sub>              |   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|                  | FCCU NO <sub>x</sub>              |   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or

Footnotes:  
<sup>1</sup>Valero (Premcor): System wide NOx interim limit is effective 12/2010 to include Lima, Memphis, and Port Arthur. The final system wide NOx limit is effective 12/2010.  
<sup>2</sup>Sinclair: Casper and/or Sinclair: may accept 20/40 ppm to be achieved by 12/31/2012



# **Petroleum Refinery Initiative**

**Information and Emissions Data by  
Individual Refiner/Refinery**

# Flint Hills (formerly Koch)

December 2000

- 3 refineries in Minnesota and Texas
- \$80 million in injunctive relief
- Annual Reductions
  - 5,200 tons of NO<sub>x</sub> and SO<sub>2</sub>
- Penalty: \$1 million
- SEPs: \$3.5 million
- Co-Plaintiff: Minnesota
- The refining business of Koch Petroleum Group was restructured into Flint Hills Resources in 2002

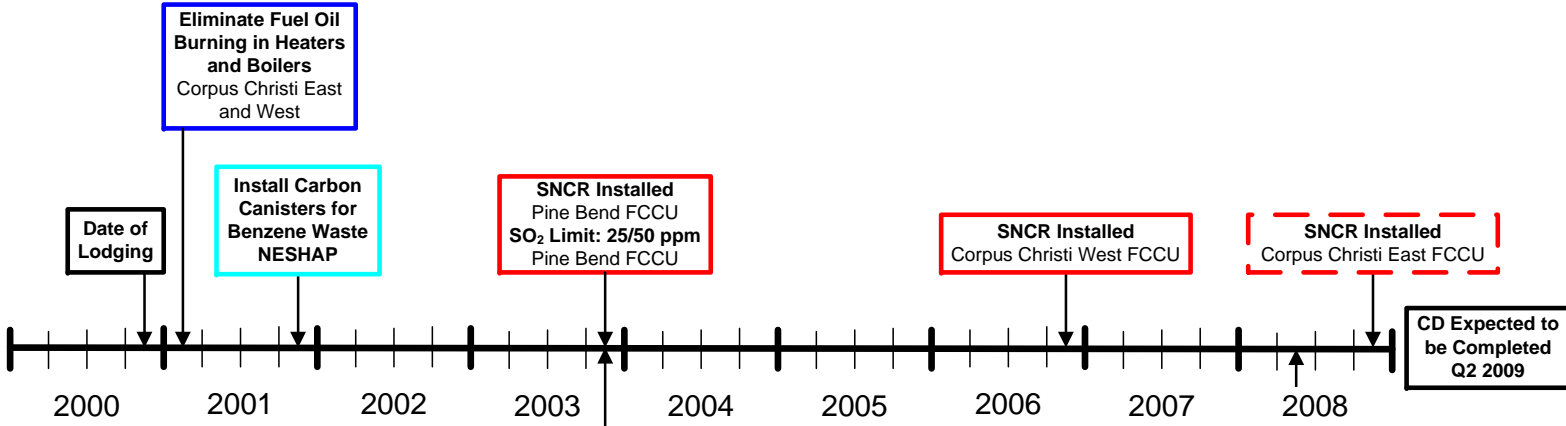


# Koch FCCU Emissions Reduction Compliance Dates

| DOL Dec 2000                    | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Flint Hills Corpus Christi East |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>            |      |      | ■    |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>            |      |      |      |      |      |      |      | △/△  |      | ▲/▲  |      |      |      |      |      |
| Flint Hills Corpus Christi West |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>            |      |      | ■    |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>            |      |      |      |      | △    | ▲    | △    | ▲    |      |      |      |      |      |      |      |
| Flint Hills Pine Bend           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>            |      |      |      | ■    |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>            | △    | ▲    | △    | ▲    |      |      |      |      |      |      |      |      |      |      |      |

Notes:  
SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

# Koch Emissions Controls Milestones



**Legend**

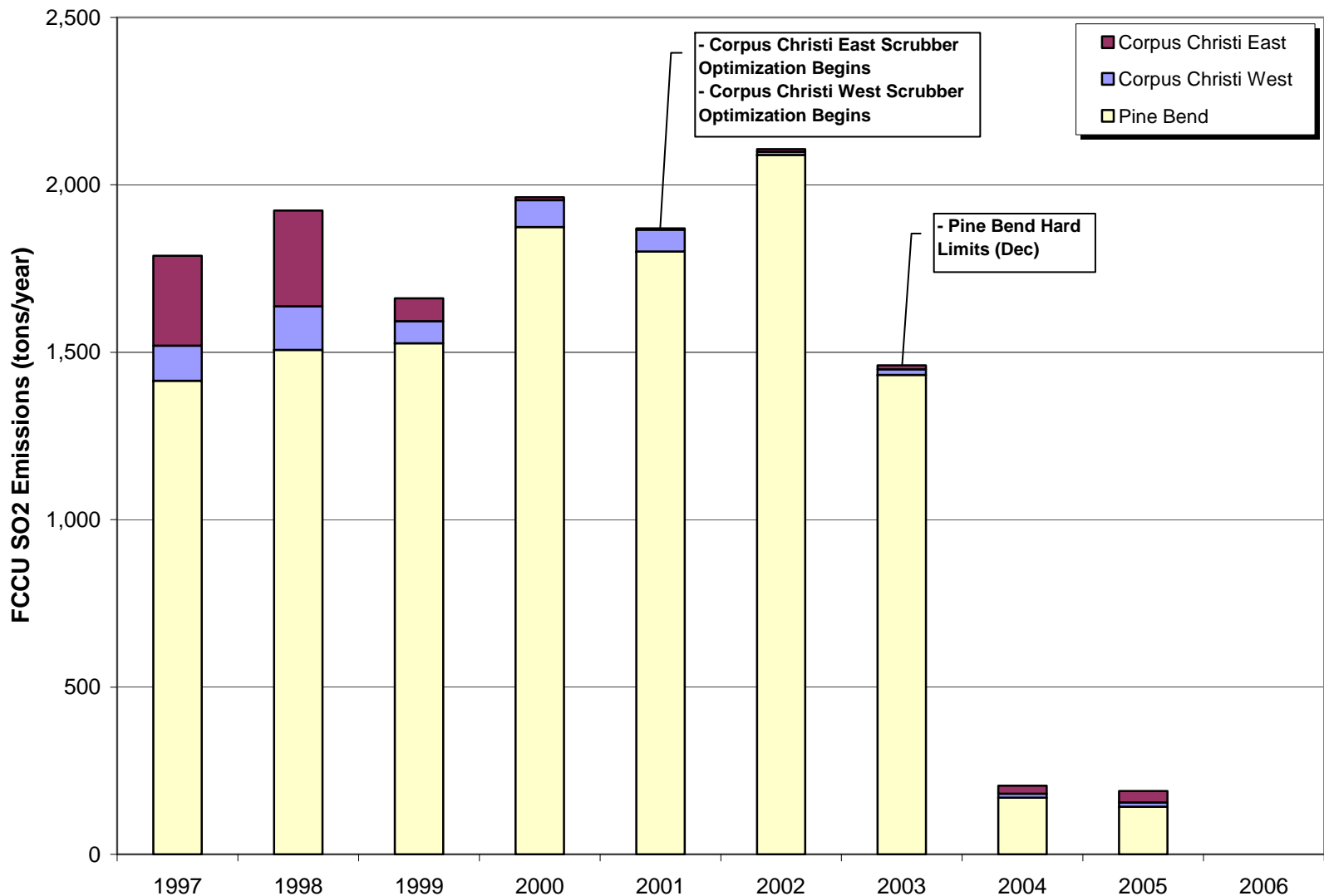
|   |  |
|---|--|
| FCCU Completed Milestones                 | FCCU Upcoming Milestones                 |
| Heaters and Boilers Completed Milestones  | Heaters and Boilers Upcoming Milestones  |
| Benzene Waste NESHAP Completed Milestones | Benzene Waste NESHAP Upcoming Milestones |
| Flaring System Completed Milestones       | Flaring System Upcoming Milestones       |

Flare Gas Recovery System Installed  
Corpus Christi East

Install Current or Next Generation Ultra Low-NO<sub>x</sub> Burners on all Heaters and Boilers greater than 40 mmBTU/hr

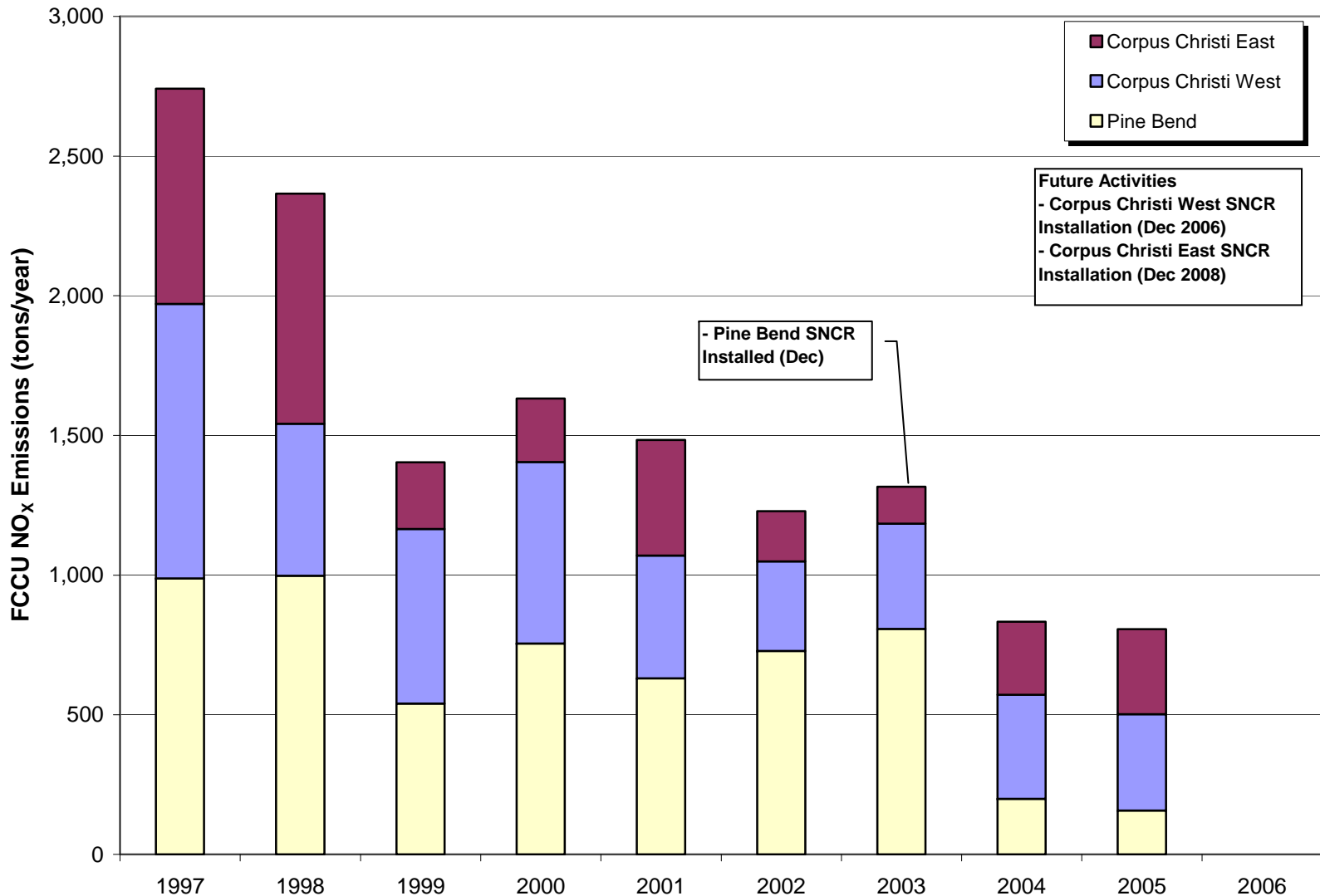
# Koch Actual FCCU SO2 Emissions

Date of Lodging: 12/22/2000



# Koch Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 12/22/2000



# BP

January 2001

- 8 refineries in California, Indiana, North Dakota, Ohio, Texas, Utah, Virginia and Washington
- \$600 million in injunctive relief
- Annual Reductions
  - 22,000 tons of NO<sub>x</sub>
  - 27,300 tons of SO<sub>2</sub>
- Penalty: \$10 million
- Co-Plaintiffs: Indiana, Northwest Air Pollution Authority and Ohio
- Tesoro Petroleum Corporation acquired the Mandan, North Dakota and Salt Lake City, Utah refineries in 2001
- Giant Yorktown, Inc. acquired the Yorktown, Virginia refinery in 2002

# BP FCCU Emissions Reduction Compliance Dates

| DOL Jan 2001          | 2001                 | 2002 | 2003 | 2004 | 2005 | 2006           | 2007 | 2008           | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |  |
|-----------------------|----------------------|------|------|------|------|----------------|------|----------------|------|------|------|------|------|------|------|--|
| Carson                | FCCU SO <sub>2</sub> |      |      |      |      | ■ <sup>1</sup> |      |                |      |      |      |      |      |      |      |  |
|                       | FCCU NO <sub>x</sub> |      |      |      |      | ▲ <sup>2</sup> |      |                |      |      |      |      |      |      |      |  |
| Texas City 1          | FCCU SO <sub>2</sub> |      |      |      |      | ■ <sup>1</sup> |      |                |      |      |      |      |      |      |      |  |
|                       | FCCU NO <sub>x</sub> |      |      |      |      | ▲ <sup>2</sup> |      |                |      |      |      |      |      |      |      |  |
| Texas City 2          | FCCU SO <sub>2</sub> |      |      |      |      | ■ <sup>1</sup> |      |                |      |      |      |      |      |      |      |  |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |                | ▲    |                |      |      |      |      |      |      |      |  |
| Texas City 3          | FCCU SO <sub>2</sub> |      |      |      |      |                | ■    |                |      |      |      |      |      |      |      |  |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |                |      | ▲              |      |      |      |      |      |      |      |  |
| Toledo                | FCCU SO <sub>2</sub> |      |      |      |      |                | ■    |                |      |      |      |      |      |      |      |  |
|                       | FCCU NO <sub>x</sub> |      |      | △    |      |                | ▲    |                |      |      |      |      |      |      |      |  |
| Whiting 500           | FCCU SO <sub>2</sub> |      |      |      |      |                | ■    |                |      |      |      |      |      |      |      |  |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |                |      | ▲              |      |      |      |      |      |      |      |  |
| Whiting 600           | FCCU SO <sub>2</sub> |      |      |      |      |                | ■    |                |      |      |      |      |      |      |      |  |
|                       | FCCU NO <sub>x</sub> |      |      |      |      |                |      | ▲ <sup>2</sup> |      |      |      |      |      |      |      |  |
| Tesoro Mandan         | FCCU SO <sub>2</sub> |      |      | □    | ■    |                |      |                |      |      |      |      |      |      |      |  |
| Tesoro Salt Lake City | FCCU SO <sub>2</sub> | ■    |      |      |      |                |      |                |      |      |      |      |      |      |      |  |
| Giant Yorktown        | FCCU SO <sub>2</sub> |      |      | □    | ■    |                |      |                |      |      |      |      |      |      |      |  |

Notes:

SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

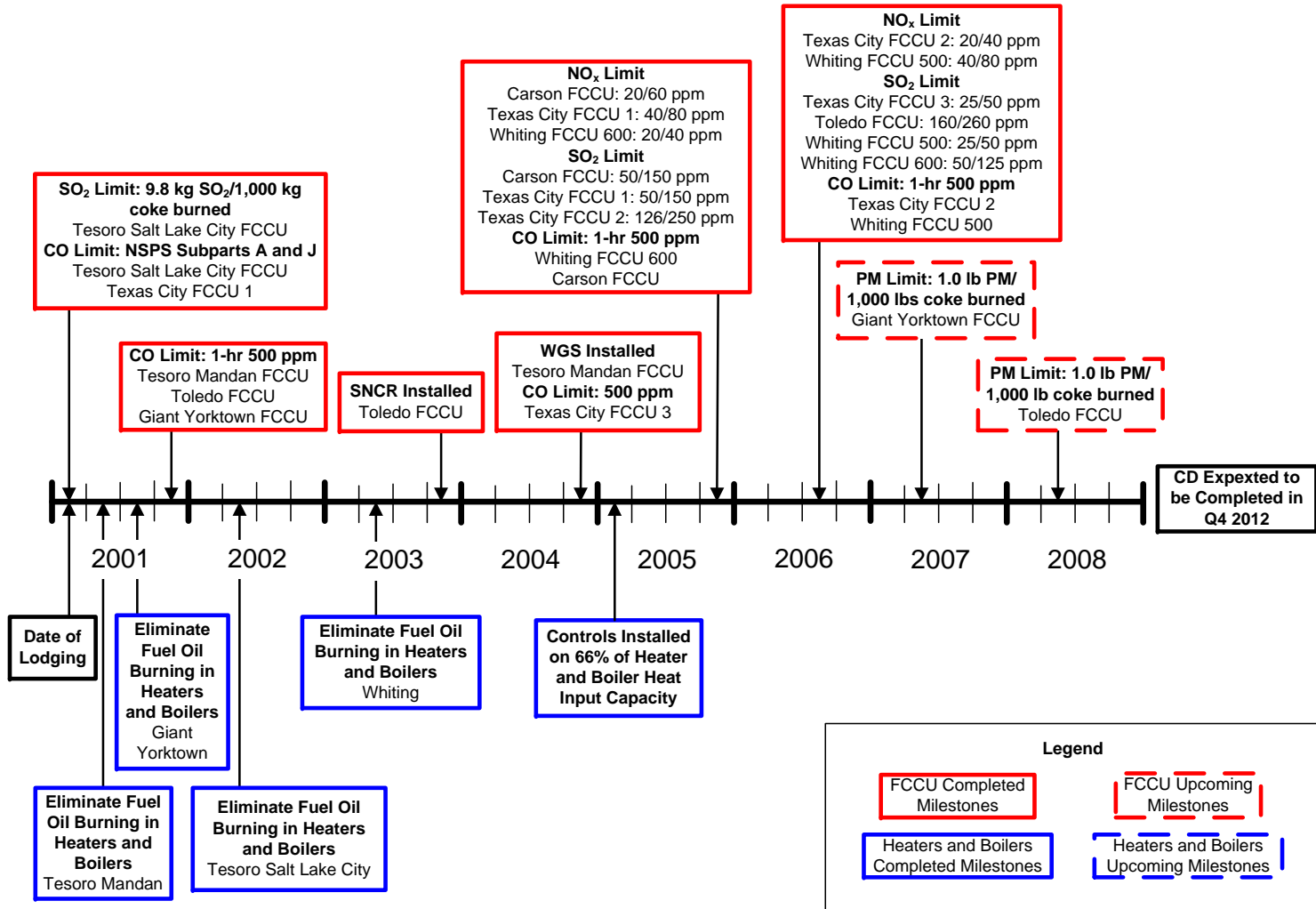
NO<sub>x</sub>: ▲ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NO<sub>x</sub> COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

<sup>1</sup>BP Carson, Texas City FCCU 1, Texas City FCCU 2: Compliance date for SO<sub>2</sub> final limits is date of entry of Fourth Amendment to the Consent Decree, October 7, 2005.

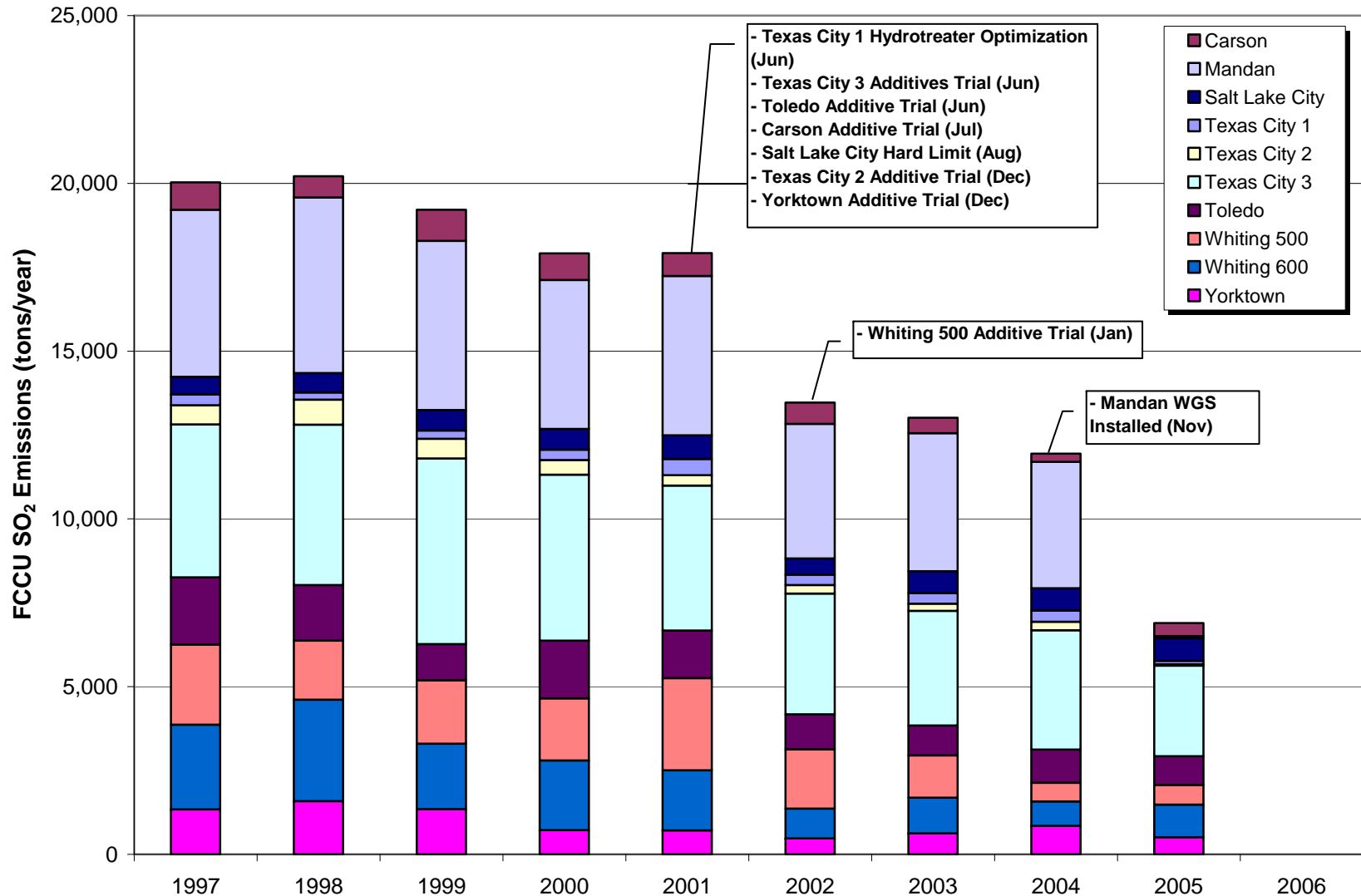
<sup>2</sup>BP Carson, Texas City FCCU 1, Whiting FCCU 600: Compliance date for NO<sub>x</sub> final limits is date of entry of Fourth Amendment to the Consent Decree, October 7, 2005.

# BP Emissions Controls Milestones



# BP Actual FCCU SO<sub>2</sub> Emissions

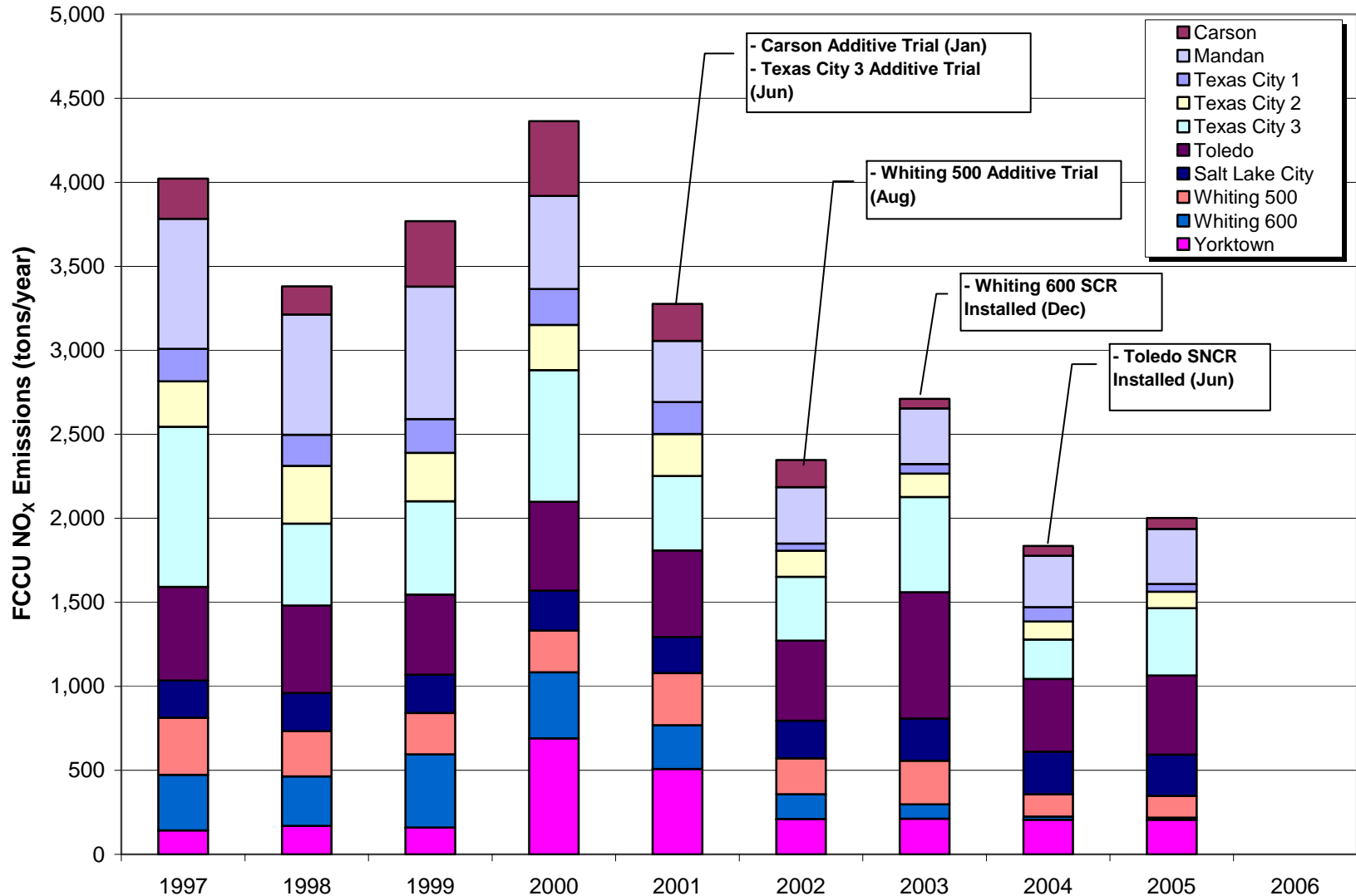
Date of Lodging: 1/18/2001





# BP Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 1/18/2001



# Motiva-Equilon-Deer Park

March 2001

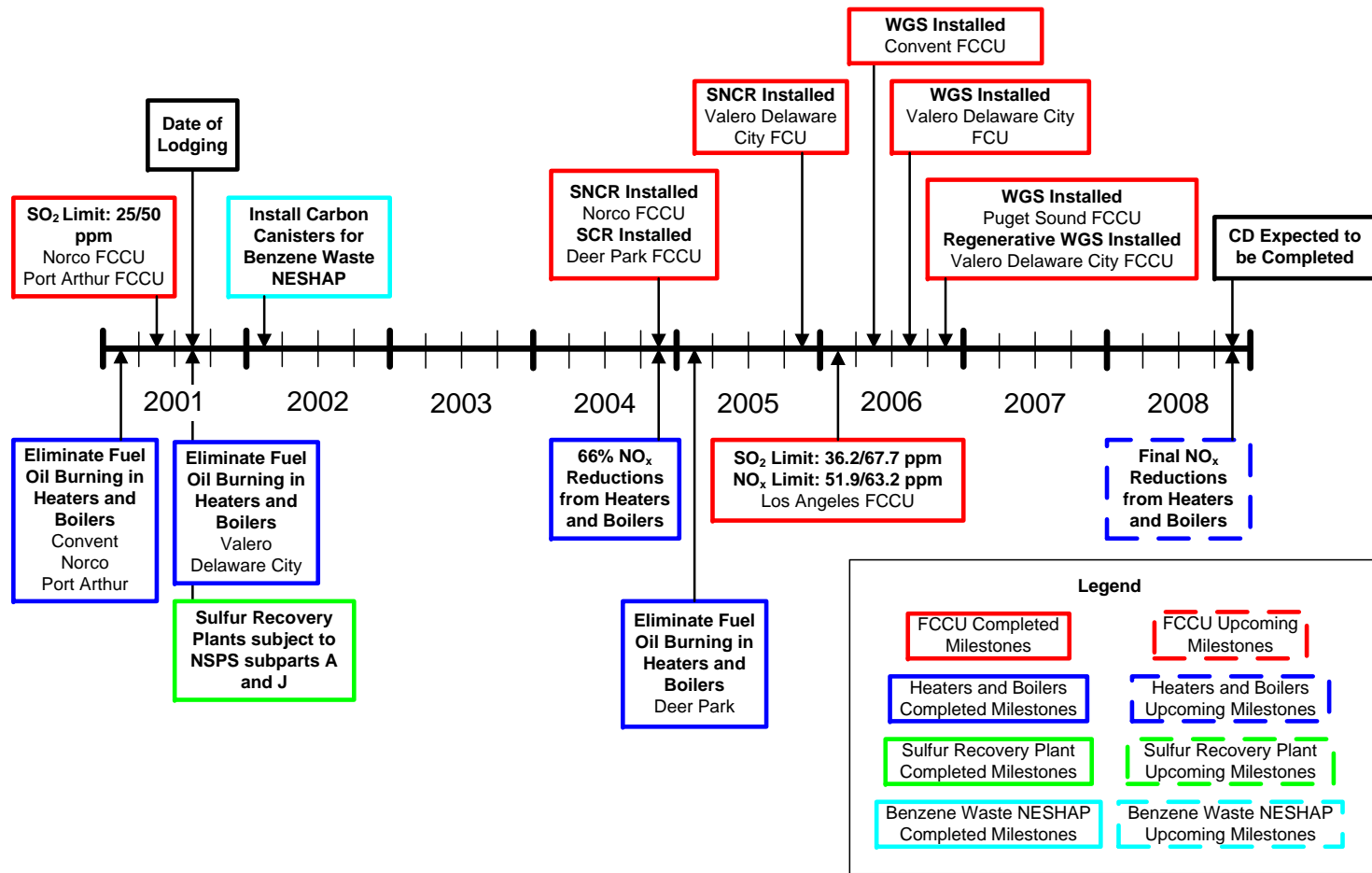
- 9 refineries in California, Delaware, Louisiana, Texas and Washington
- \$400 million in injunctive relief
- Annual Reductions
  - 8,000 tons of NO<sub>x</sub>
  - 49,550 tons of SO<sub>2</sub>
- Penalty: \$9.5 million
- SEPs: \$5.5 million
- Co-Plaintiffs: Delaware, Louisiana, Northwest Air Pollution Authority and Sierra Club
- Premcor Refining Group, Inc. acquired the Delaware City refinery in 2004
- Valero acquired Premcor and the Delaware City refinery in 2005
- Big West of California, LLC acquired the Bakersfield refinery in 2005

# M-E-DP FCCU Emissions Reduction Compliance Dates

| DOL Mar 2001               | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Motiva Convent             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Motiva Norco               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Motiva Port Arthur         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Shell Deer Park            |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Shell Los Angeles          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Shell Martinez             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Shell Puget Sound          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Valero Delaware City FCCU  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Valero Delaware City Coker |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

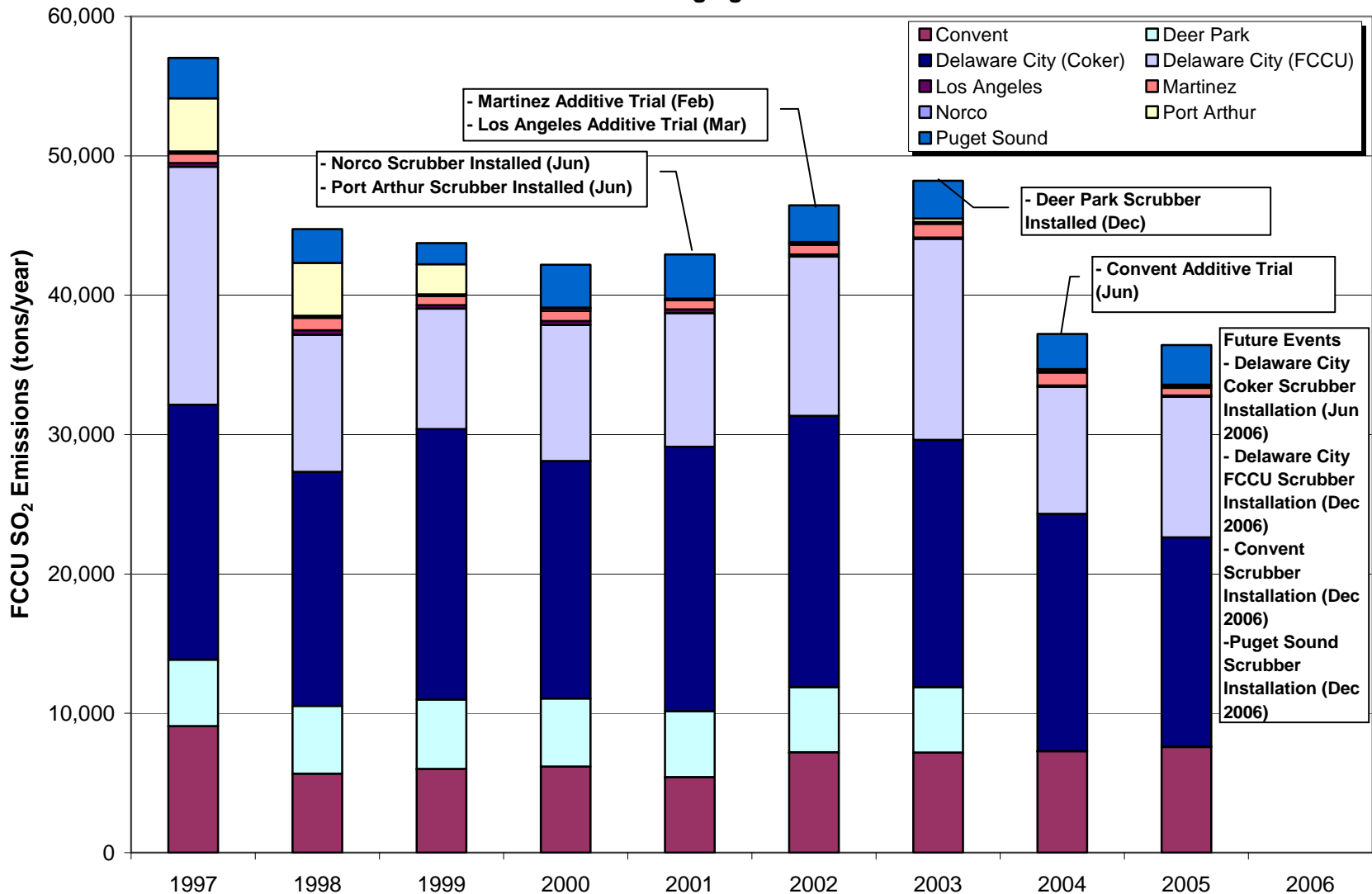
Notes:  
SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

# M-E-DP Emissions Controls Milestones



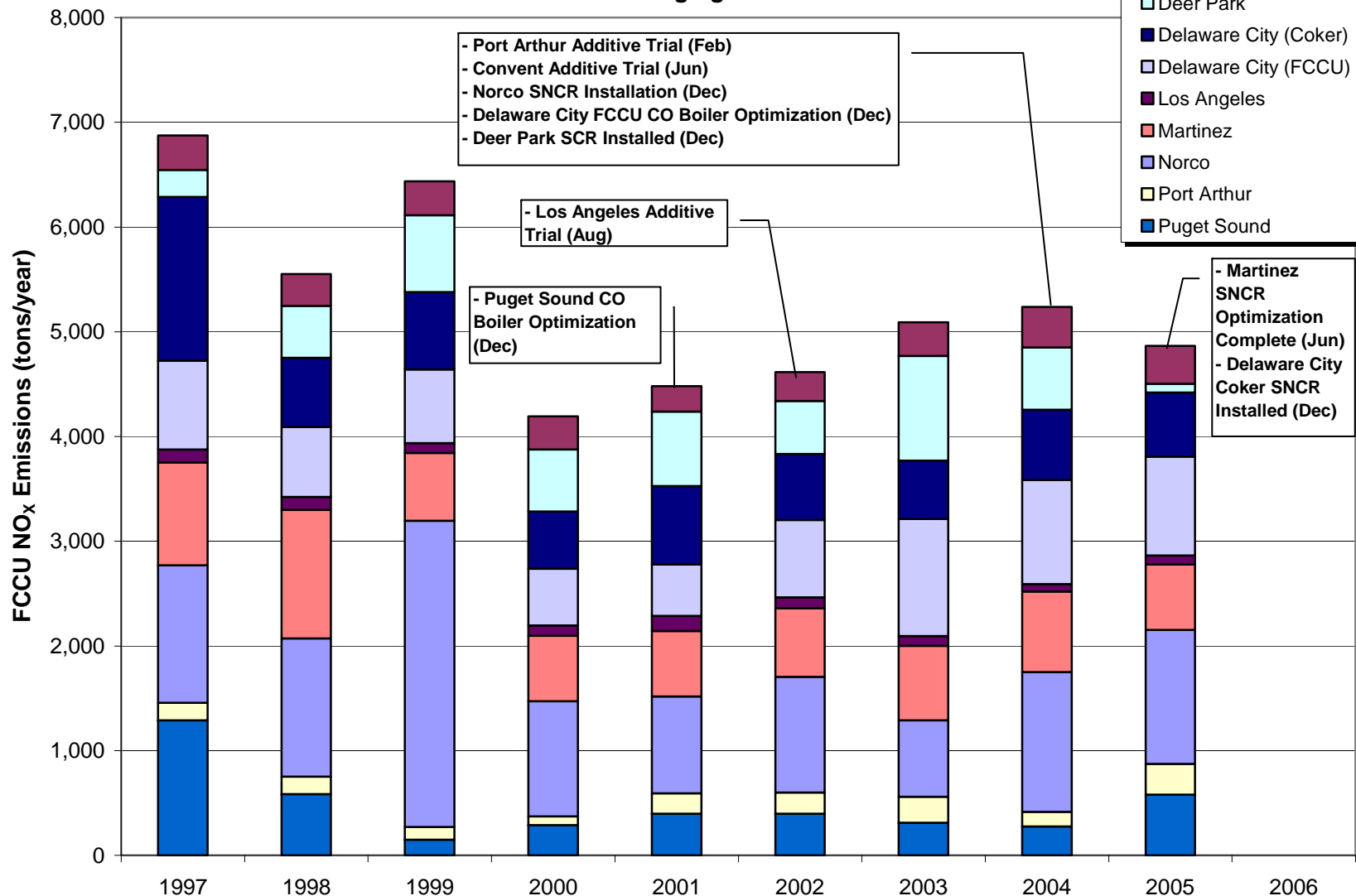
# Motiva-Equilon-Deer Park Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 3/21/2001



# Motiva-Equilon-Deer Park Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 3/21/2001



# Marathon Ashland Petroleum

May 2001

- 7 refineries in Illinois, Kentucky, Louisiana, Michigan, Minnesota, Ohio and Texas
- \$265 million in injunctive relief
- Annual Reductions
  - 8,000 tons of NOx
  - 12,800 tons of SO2
- Penalty: \$3.8 million
- SEPs: \$6.5 million
- Co-Plaintiffs: County of Wayne, Michigan, Louisiana and Minnesota
- Marathon Oil Corp. acquired Ashland Inc.'s interests in Marathon Ashland Petroleum and changed the name to Marathon Petroleum Company in 2005

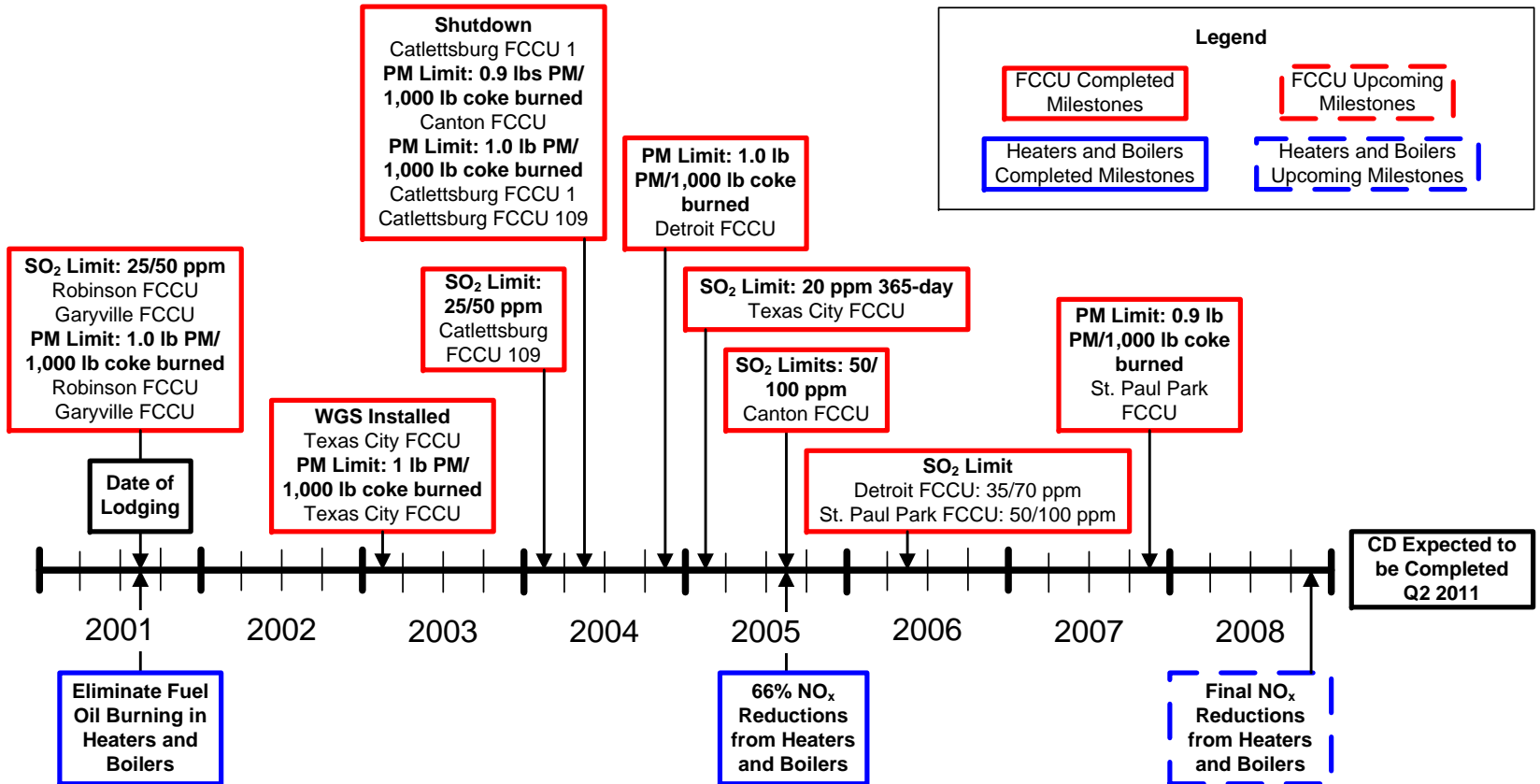
# MAP FCCU Emissions Reduction Compliance Dates

| DOL May 2001       | 2001                 | 2002         | 2003 | 2004         | 2005         | 2006         | 2007         | 2008 | 2009 | 2010 | 2011         | 2012 | 2013 | 2014 | 2015 |  |
|--------------------|----------------------|--------------|------|--------------|--------------|--------------|--------------|------|------|------|--------------|------|------|------|------|--|
| Canton             | FCCU SO <sub>2</sub> | [Yellow bar] |      |              |              | ■            |              |      |      |      |              |      |      |      |      |  |
|                    | FCCU NO <sub>x</sub> |              | △    | [Yellow bar] |              |              | ▲            |      |      |      |              |      |      |      |      |  |
| Cattlettsburg FCCU | FCCU SO <sub>2</sub> | [Yellow bar] |      |              | ■            |              |              |      |      |      |              |      |      |      |      |  |
|                    | FCCU NO <sub>x</sub> | [Yellow bar] |      |              |              | ▲            |              |      |      |      |              |      |      |      |      |  |
| Cattlettsburg RCCU | FCCU SO <sub>2</sub> | [Yellow bar] |      |              | ■            |              |              |      |      |      |              |      |      |      |      |  |
|                    | FCCU NO <sub>x</sub> | [Yellow bar] |      |              |              | △            | [Yellow bar] |      | ▲    |      |              |      |      |      |      |  |
| Detroit            | FCCU SO <sub>2</sub> | [Yellow bar] |      |              |              |              | ■            |      |      |      |              |      |      |      |      |  |
|                    | FCCU NO <sub>x</sub> |              | △    | [Yellow bar] |              |              | ▲            |      |      |      |              |      |      |      |      |  |
| Garyville          | FCCU SO <sub>2</sub> | ■            |      |              |              |              |              |      |      |      |              |      |      |      |      |  |
|                    | FCCU NO <sub>x</sub> | [Yellow bar] |      | △            | [Yellow bar] |              |              | ▲    |      |      |              |      |      |      |      |  |
| Robinson           | FCCU SO <sub>2</sub> | ■            |      |              |              |              |              |      |      |      |              |      |      |      |      |  |
|                    | FCCU NO <sub>x</sub> | [Yellow bar] |      |              |              |              |              |      |      | △    | [Yellow bar] |      | ▲    |      |      |  |
| St. Paul Park      | FCCU SO <sub>2</sub> | [Yellow bar] |      |              |              |              | ■            |      |      |      |              |      |      |      |      |  |
|                    | FCCU NO <sub>x</sub> | [Yellow bar] |      |              | △            | [Yellow bar] |              |      | ▲    |      |              |      |      |      |      |  |
| Texas City         | FCCU SO <sub>2</sub> | [Yellow bar] |      | □            | [Yellow bar] |              | ■            |      |      |      |              |      |      |      |      |  |
|                    | FCCU NO <sub>x</sub> | [Yellow bar] |      |              |              |              |              | ▲    |      |      |              |      |      |      |      |  |

Notes:  
SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

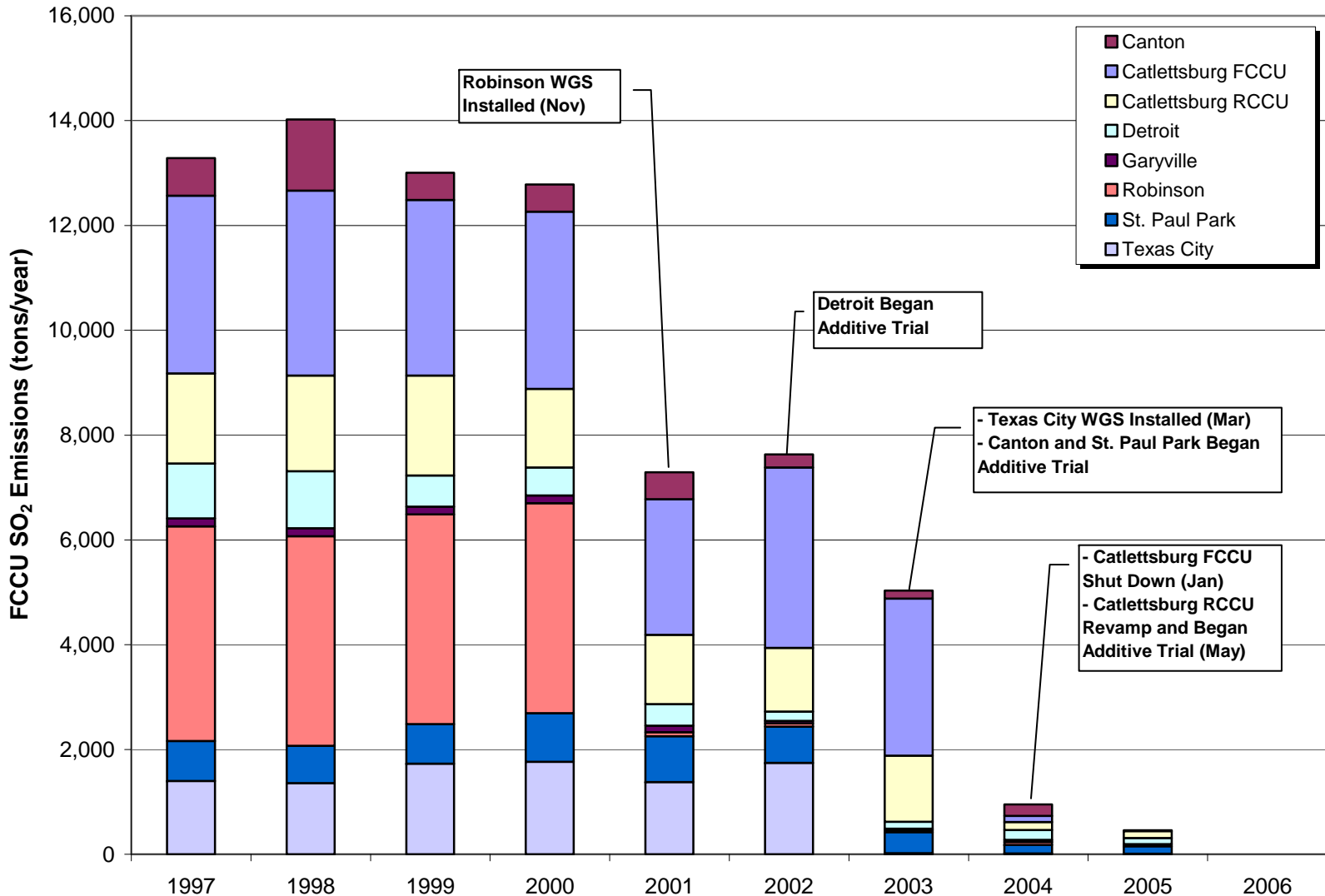


# MAP Emissions Controls Milestones



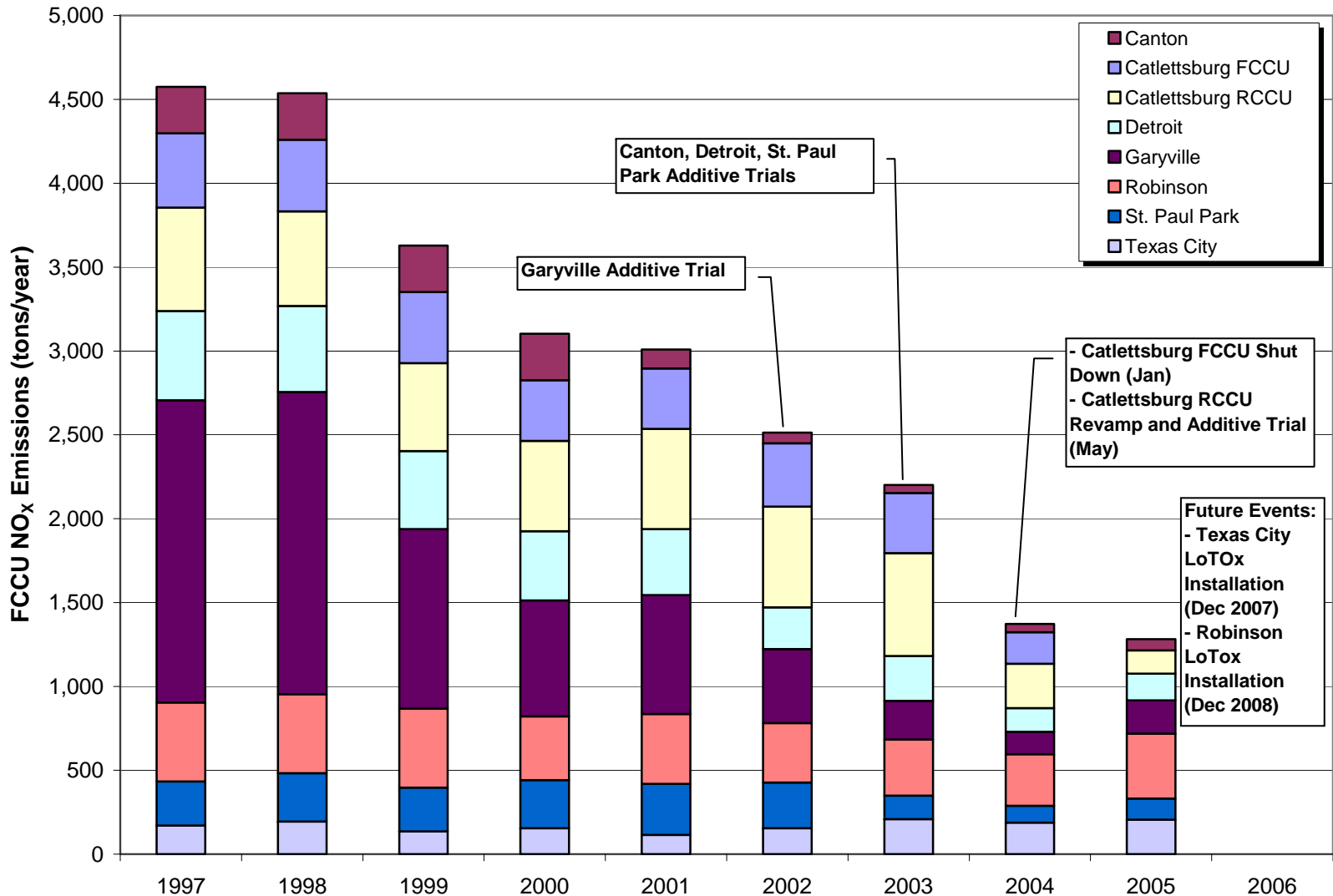
# MAP Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 5/11/2001



# MAP Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 5/11/2001



# Conoco

## (pre-merger with Phillips Petroleum)

December 2001

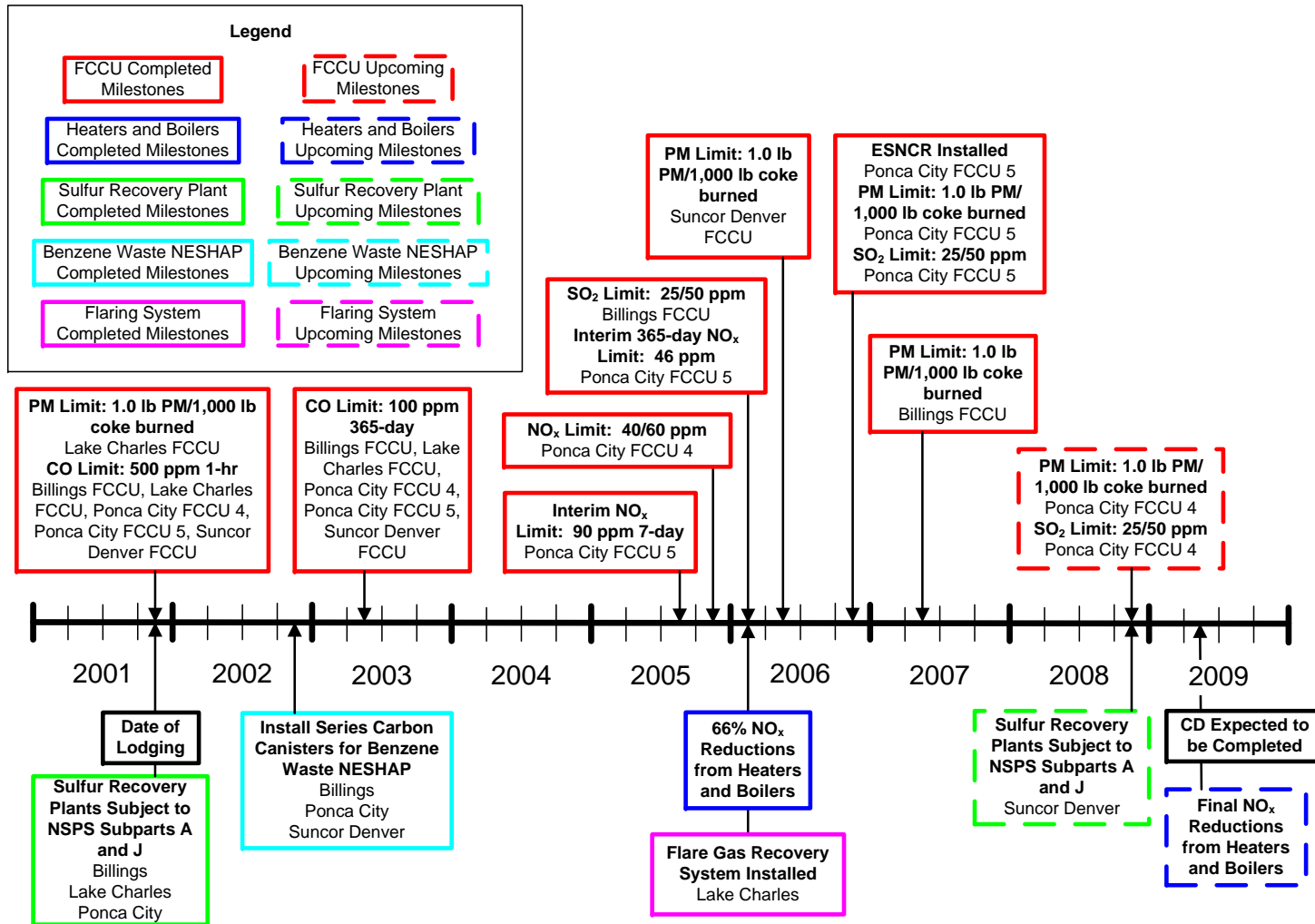
- 4 refineries in Colorado, Louisiana, Montana and Oklahoma
- \$110 million in injunctive relief
- Annual Reductions
  - 3,210 tons of NO<sub>x</sub>
  - 4,000 tons of SO<sub>2</sub>
- Penalty: \$1.5 million
- SEPs: \$5.1 million
- Co-Plaintiffs: Colorado, Louisiana, Montana and Oklahoma
- Suncor Energy (U.S.A.) Inc. acquired the Denver, Colorado refinery in 2003 (later integrated with adjacent refinery acquired from Valero in 2005)

# Conoco FCCU Emissions Reduction Compliance Dates

| DOL Dec 2001  | 2001                 | 2002         | 2003 | 2004 | 2005         | 2006         | 2007 | 2008           | 2009           | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |  |
|---------------|----------------------|--------------|------|------|--------------|--------------|------|----------------|----------------|------|------|------|------|------|------|--|
| Billings      | FCCU SO <sub>2</sub> | [Yellow bar] |      |      |              |              | ■    |                |                |      |      |      |      |      |      |  |
|               | FCCU NO <sub>x</sub> | [Yellow bar] |      |      |              |              | △    | [Yellow bar]   |                | ▲    |      |      |      |      |      |  |
| Lake Charles  | FCCU SO <sub>2</sub> | [Yellow bar] |      | □    | [Yellow bar] |              |      | ■              |                |      |      |      |      |      |      |  |
|               | FCCU NO <sub>x</sub> | [Yellow bar] |      | △    | [Yellow bar] |              |      | ▲              |                |      |      |      |      |      |      |  |
| Ponca City 4  | FCCU SO <sub>2</sub> | [Yellow bar] |      | □    | [Yellow bar] |              |      | ■              | [Yellow bar]   |      | ■    |      |      |      |      |  |
|               | FCCU NO <sub>x</sub> | [Yellow bar] |      |      |              |              | ▲    | [Yellow bar]   |                |      |      |      |      |      |      |  |
| Ponca City 5  | FCCU SO <sub>2</sub> | [Yellow bar] |      | □    | [Yellow bar] |              |      | ■              | [Yellow bar]   |      | ■    |      |      |      |      |  |
|               | FCCU NO <sub>x</sub> | [Yellow bar] |      |      |              |              | ▲    | [Yellow bar]   |                |      | ▲    |      |      |      |      |  |
| Suncor Denver | FCCU SO <sub>2</sub> | [Yellow bar] |      | □    | [Yellow bar] |              |      | ■ <sup>2</sup> |                |      |      |      |      |      |      |  |
|               | FCCU NO <sub>x</sub> | [Yellow bar] |      |      | △            | [Yellow bar] |      |                | ▲ <sup>3</sup> |      |      |      |      |      |      |  |

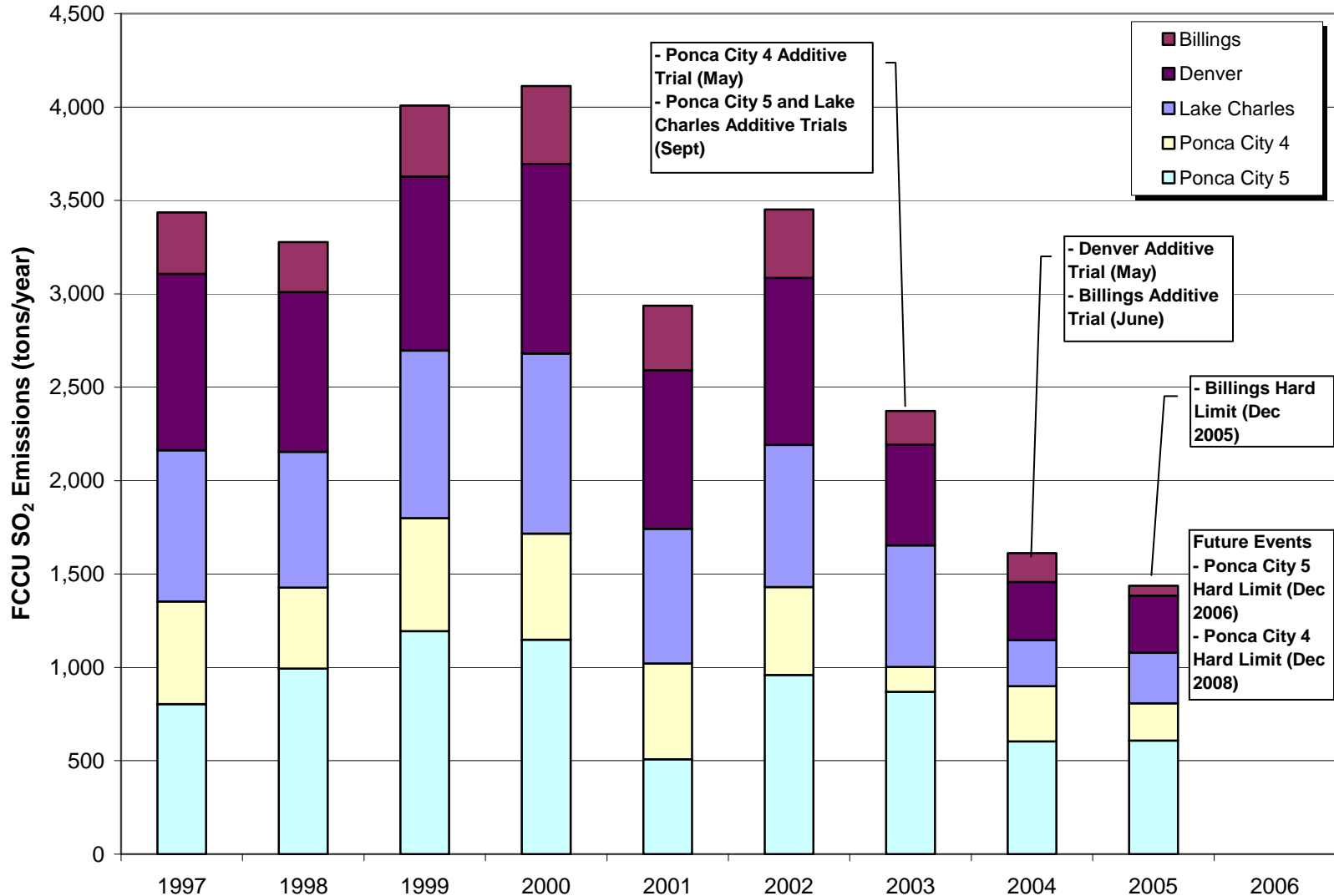
Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

# Conoco Emissions Controls Milestones



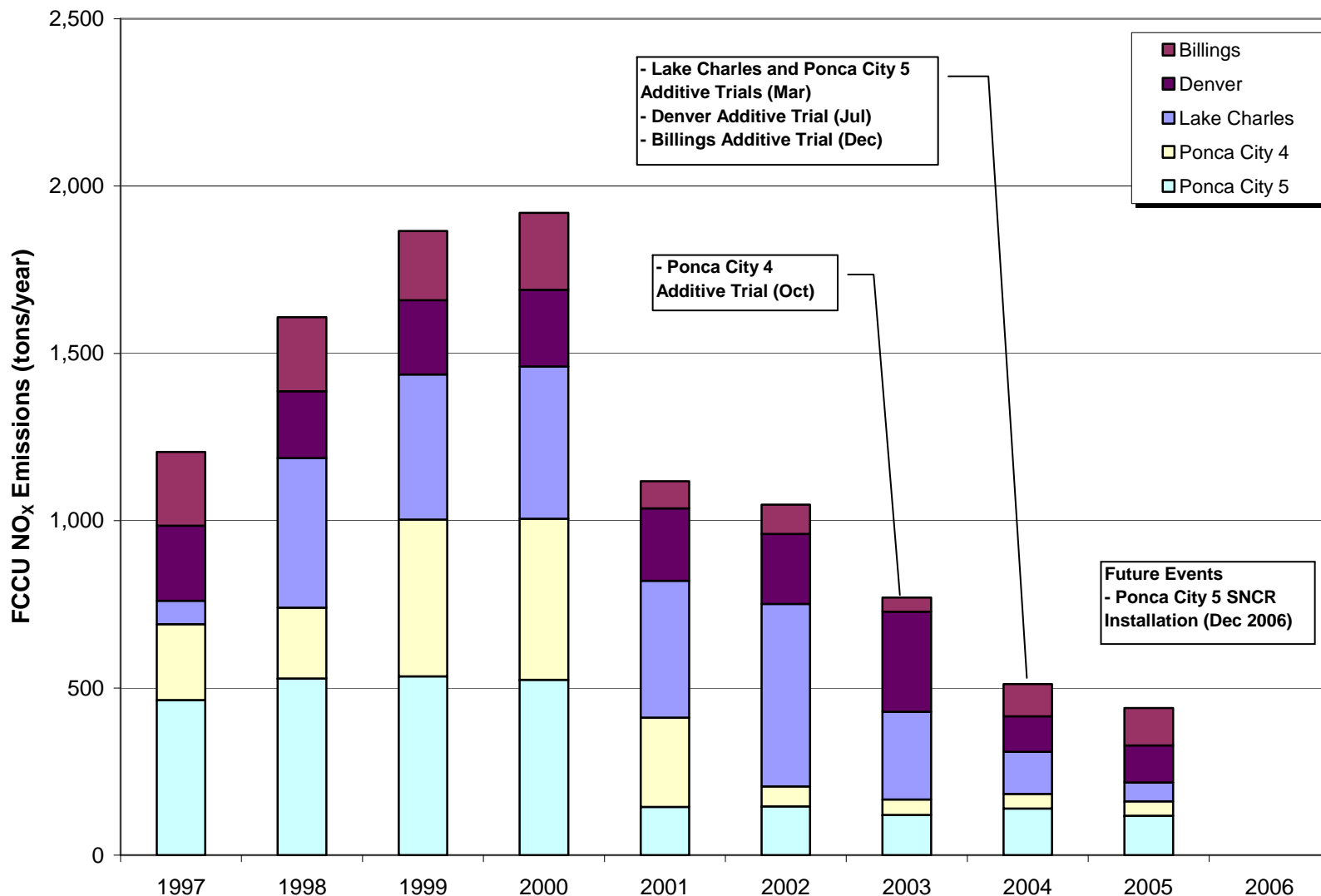
## Conoco and Suncor Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 12/20/2001



## Conoco and Suncor Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 12/20/2001





# Navajo-Montana

December 2001

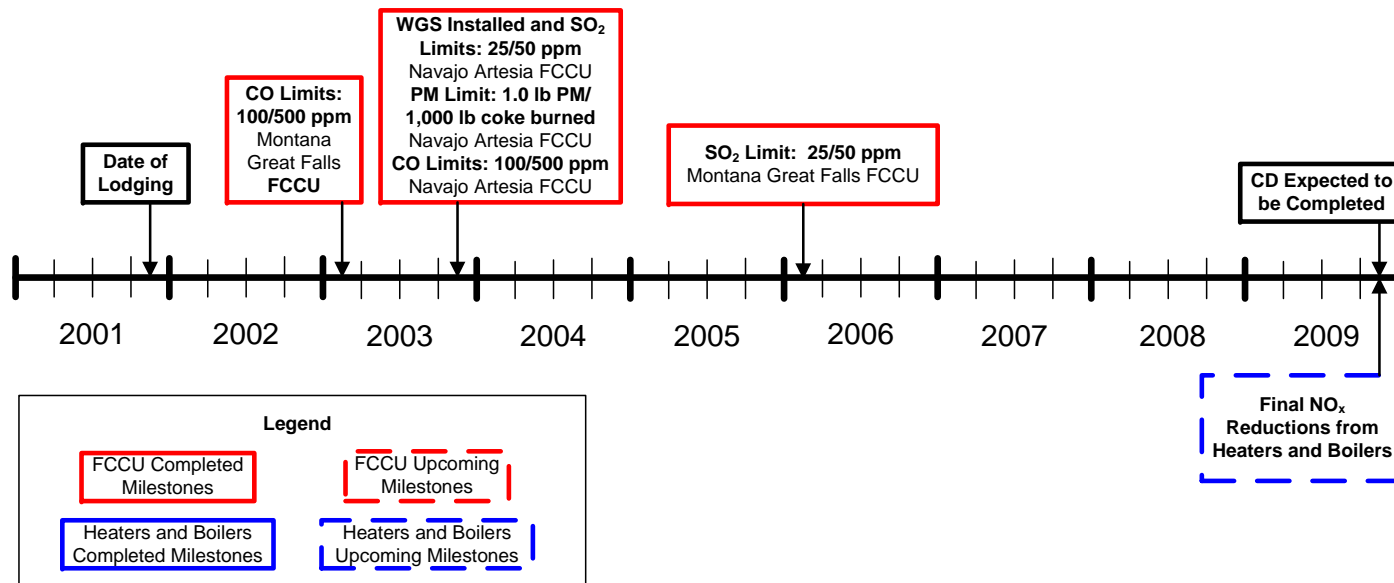
- 3 refineries in Montana and New Mexico
- \$15 million in injunctive relief
- Annual Reductions
  - 2,500 tons of NO<sub>x</sub>
  - 2,350 tons of SO<sub>2</sub>
- Penalty: \$750,000
- SEPs: \$200,000
- Co-Plaintiffs: Montana and New Mexico

# Navajo-Montana FCCU Emissions Reduction Compliance Dates

| DOL Dec 2001         | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Navajo Artesia       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Montana Great Falls  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

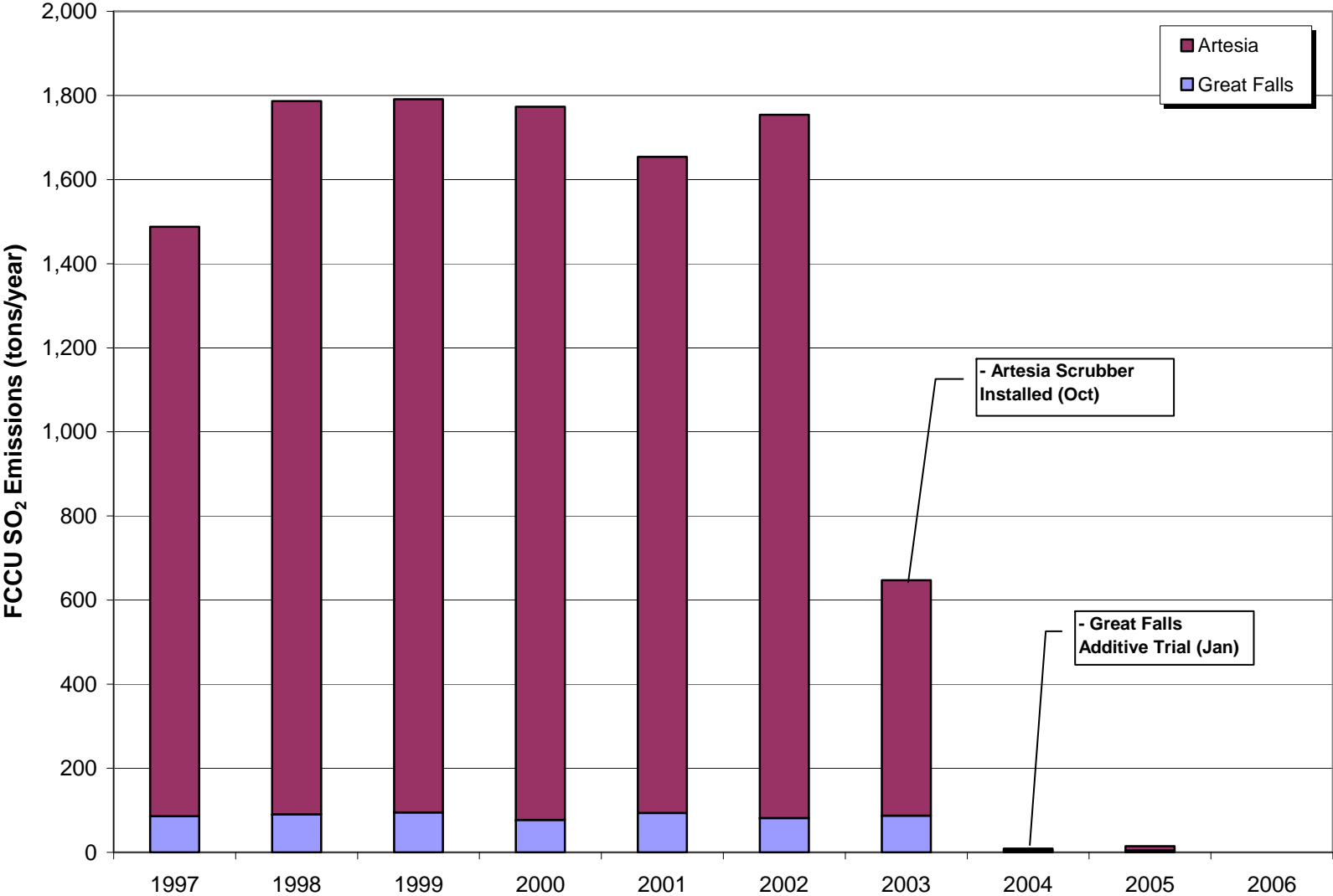
Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

# Navajo-Montana Emissions Controls Milestones



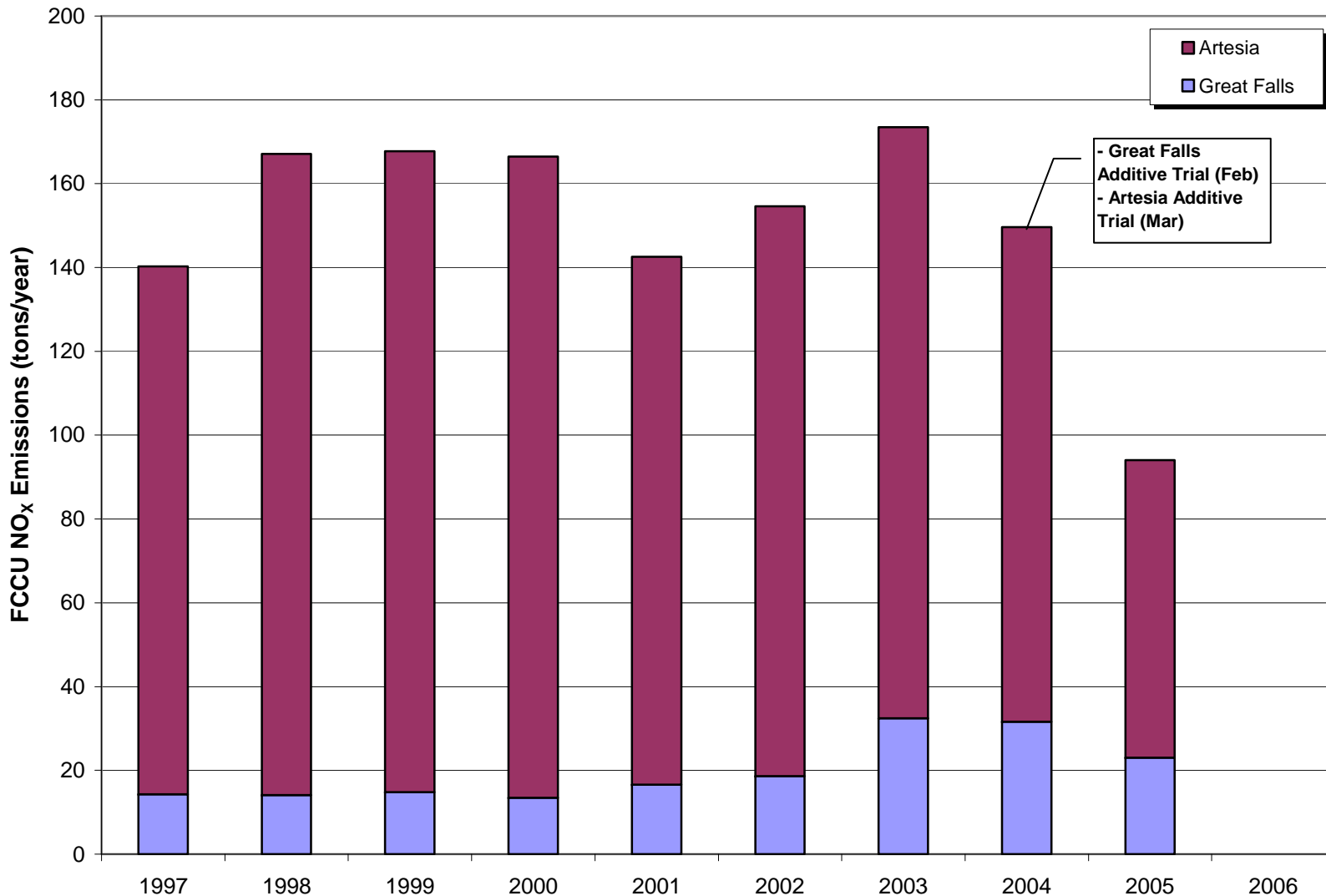
# Navajo-Montana Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 12/20/2001



# Navajo-Montana Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 12/20/2001



# Lion Oil

May 2003

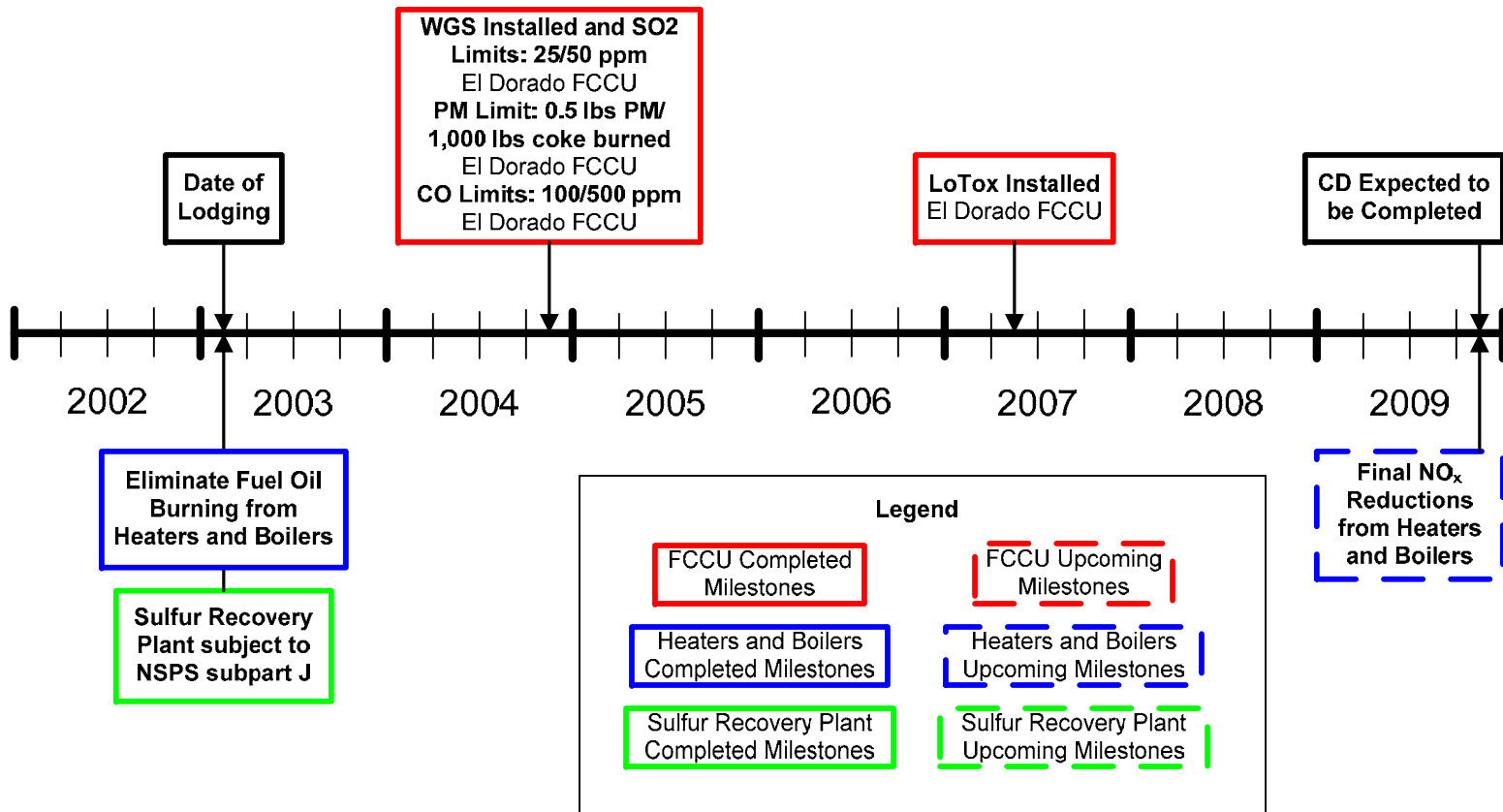
- 1 refinery in Arkansas
- \$21.5 million in injunctive relief
- Annual Reductions
  - 530 tons of NO<sub>x</sub>
  - 650 tons of SO<sub>2</sub>
- Penalty: \$348,000
- SEPs: \$450,000
- Co-Plaintiffs: Arkansas

# Lion Oil FCCU Emissions Reduction Compliance Dates

|                      | DOL Oct 2003 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------------|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| El Dorado            |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |              |      |      |      | □■   |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub> |              |      |      |      |      |      |      | △    |      | ▲    |      |      |      |      |      |      |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

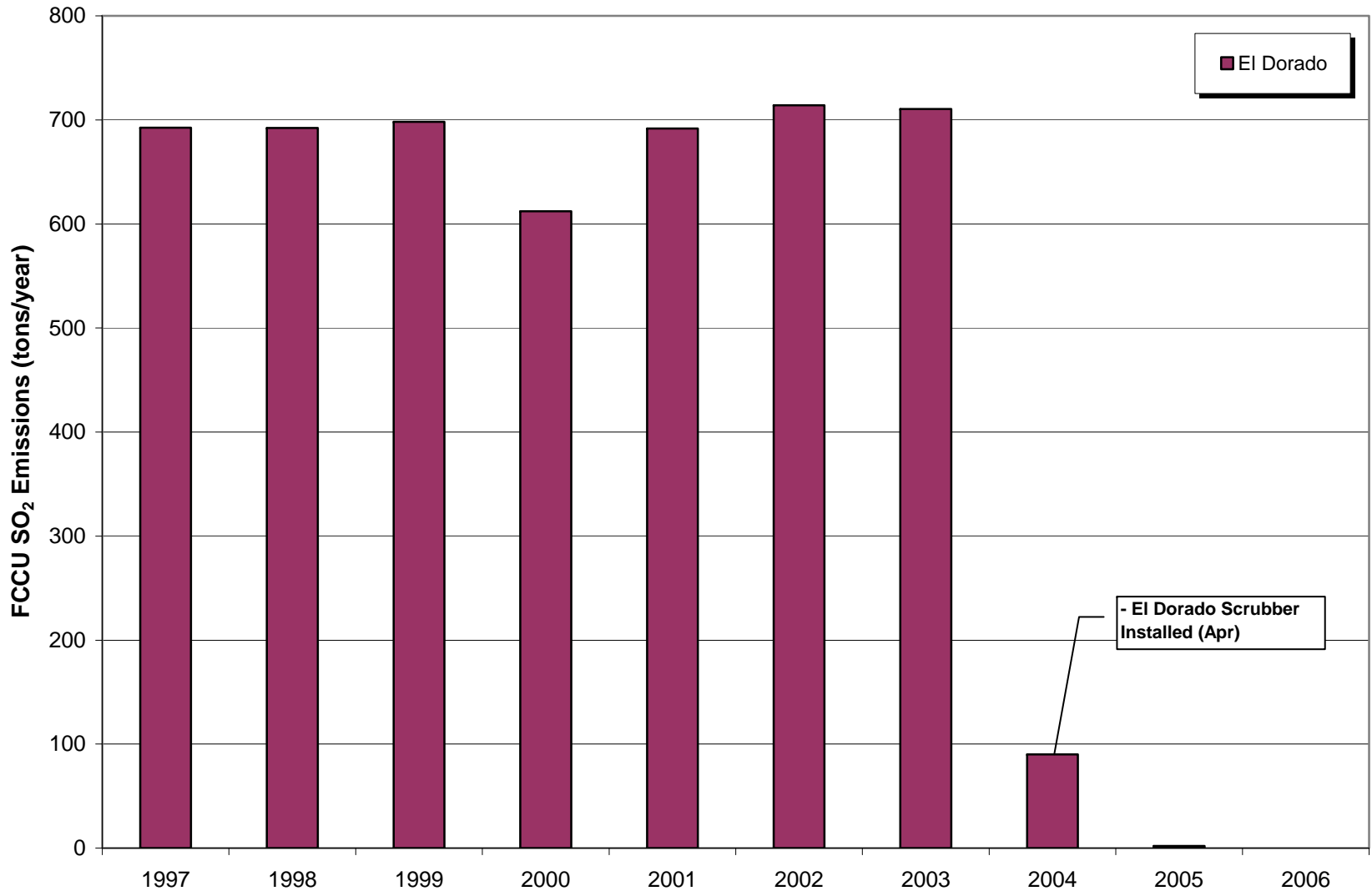
# Lion Oil Emissions Controls Milestones





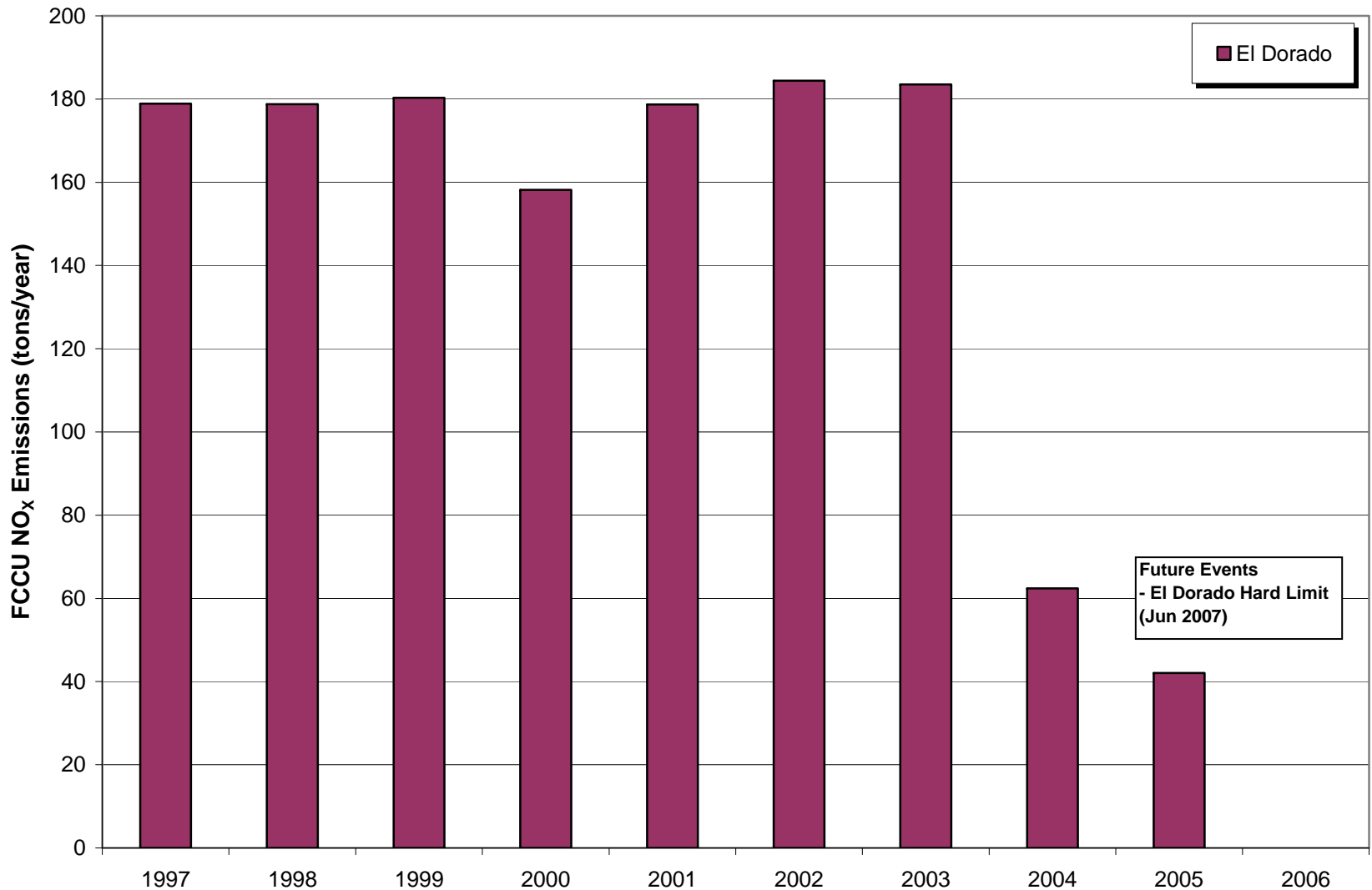
# Lion Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 3/11/2003



# Lion Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 3/11/2003



# CHS-Coastal-Ergon

October 2003

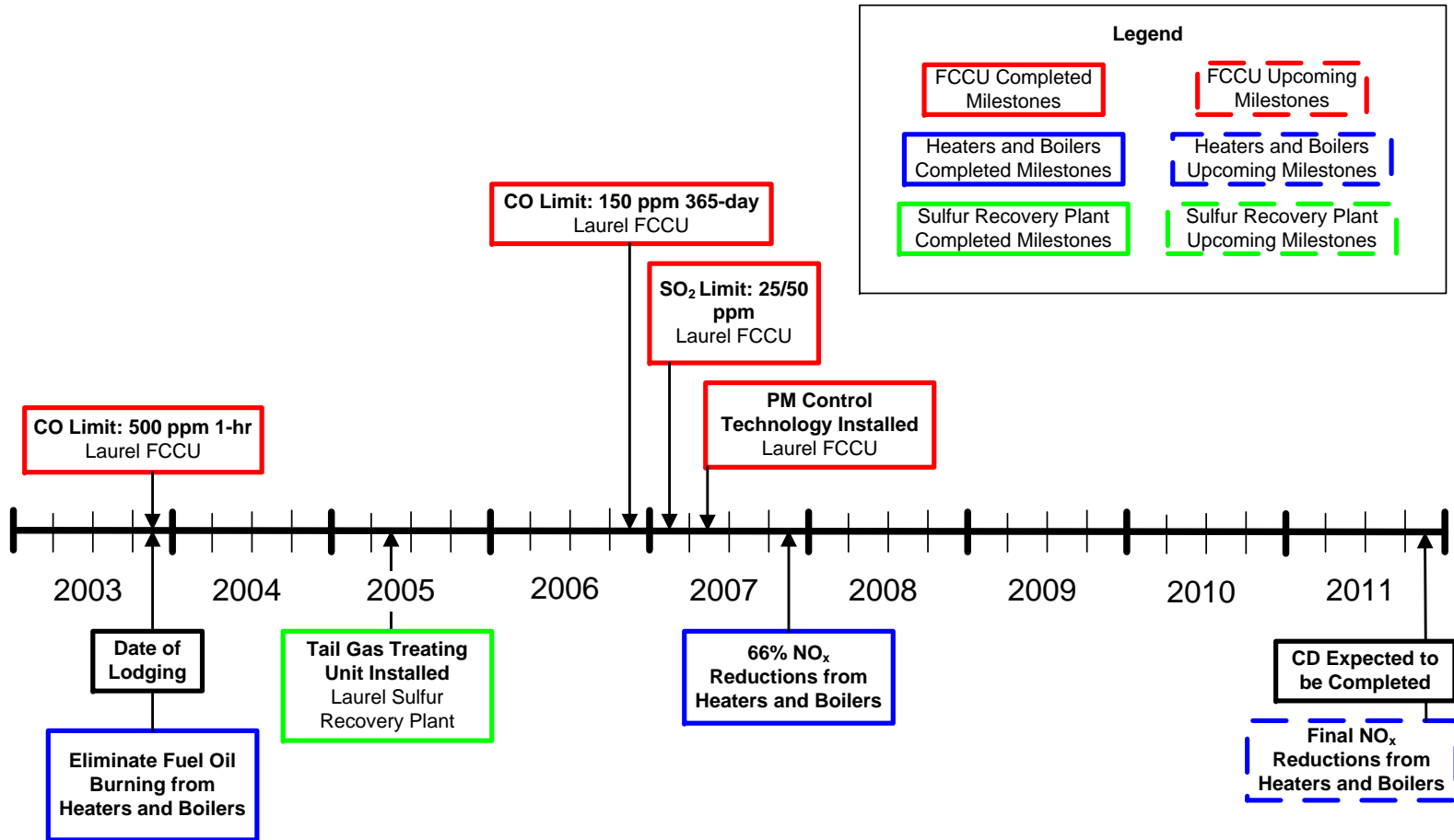
- 4 refineries in Mississippi, Montana, New Jersey and West Virginia
- Annual Reductions
  - 1,100 tons of NO<sub>x</sub>
  - 2,800 tons of SO<sub>2</sub>
- Penalty: \$2.9 million
- SEPs: \$1.6 million
- Co-Plaintiffs: Montana (CHS), New Jersey (Coastal), Mississippi Commission on Environmental Quality and West Virginia Department of Environmental Protection (Ergon)
- Sunoco, Inc. acquired the Eagle Point (Westville, New Jersey) refinery in 2004

# CHS FCCU Emissions Reduction Compliance Dates

|                      | DOL Oct 2003 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------------|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Laurel               |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub> |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

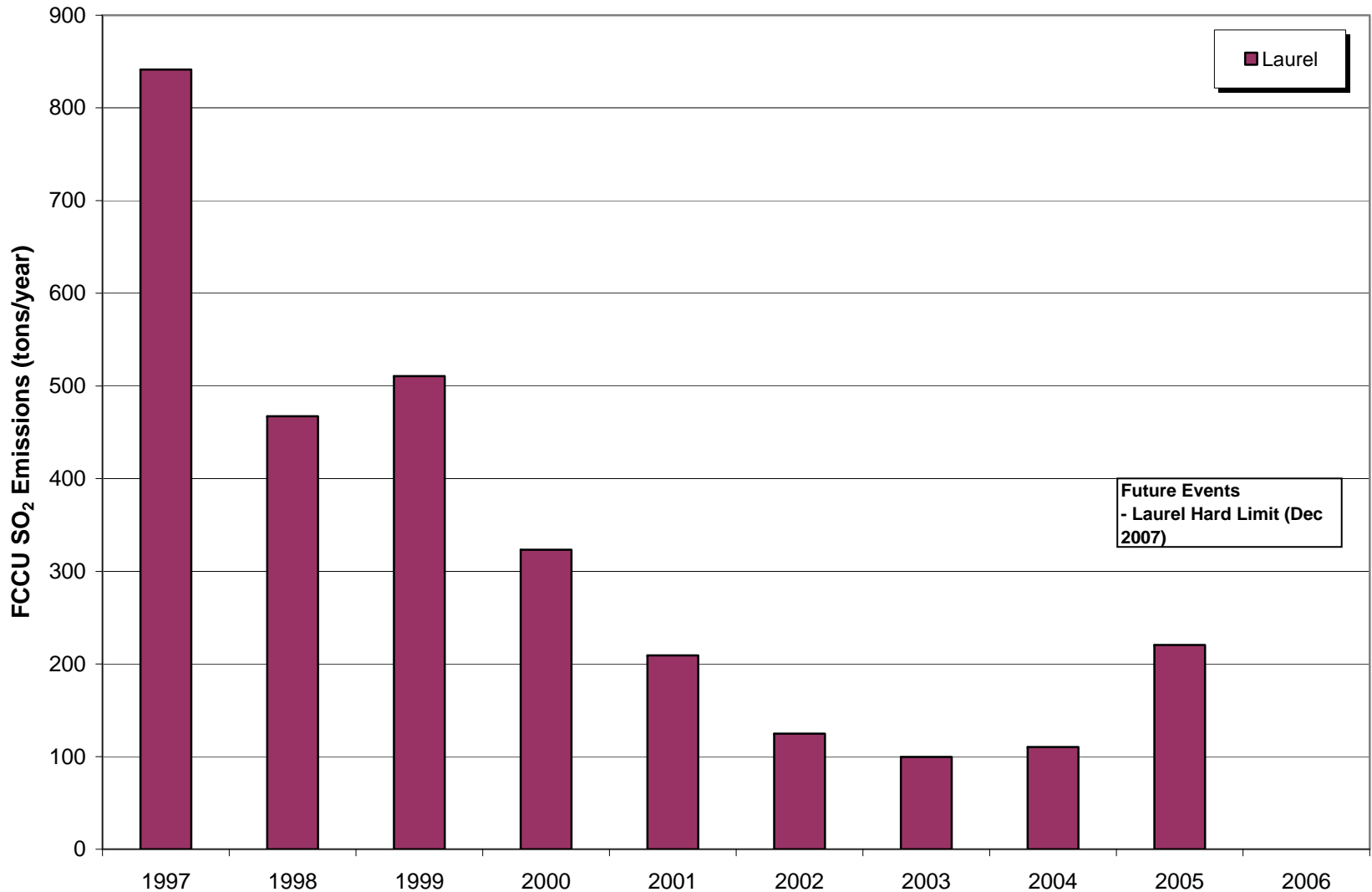
Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

# CHS Emissions Controls Milestones



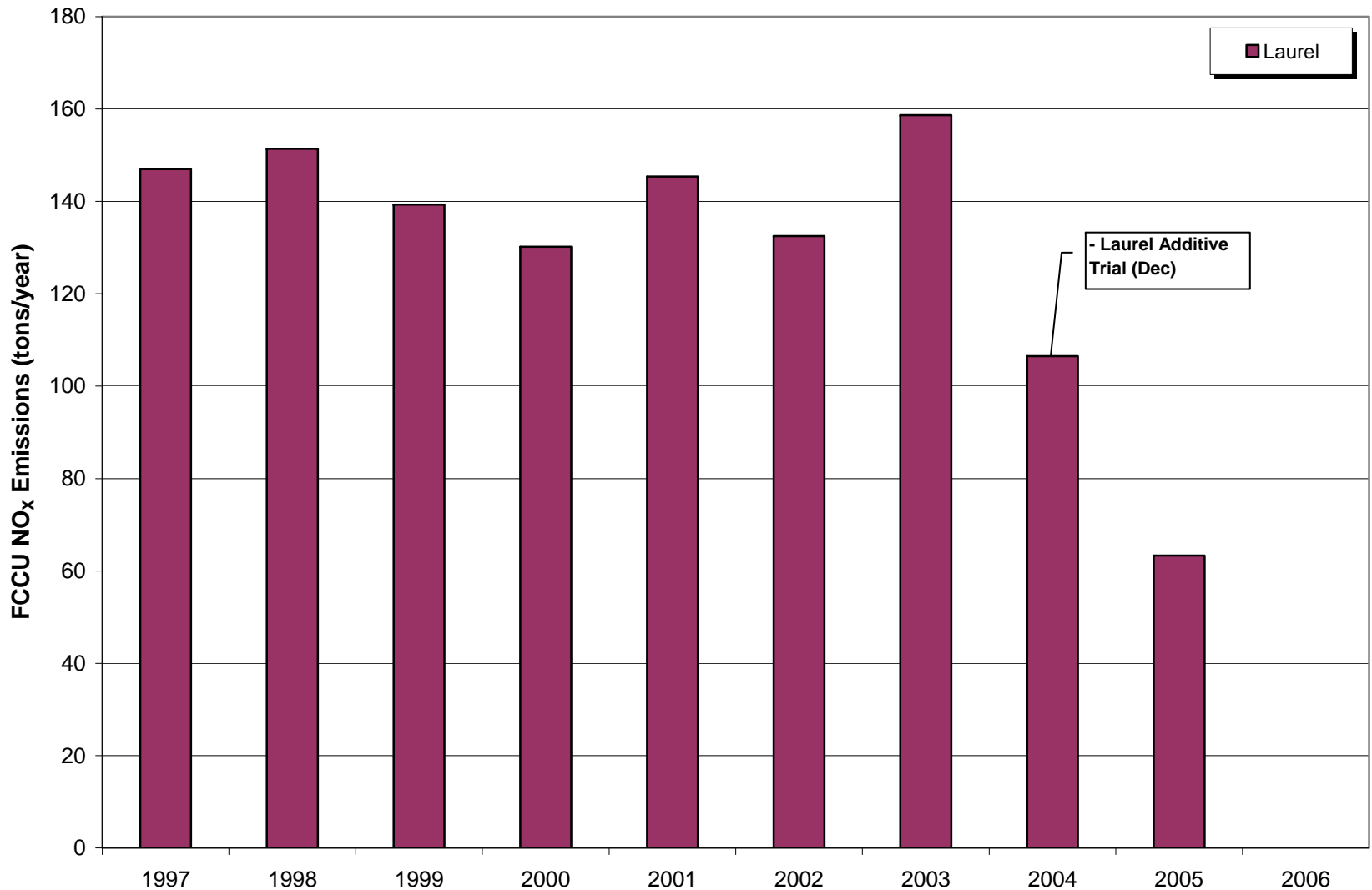
# CHS Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 9/30/2003



# CHS Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 9/30/2003



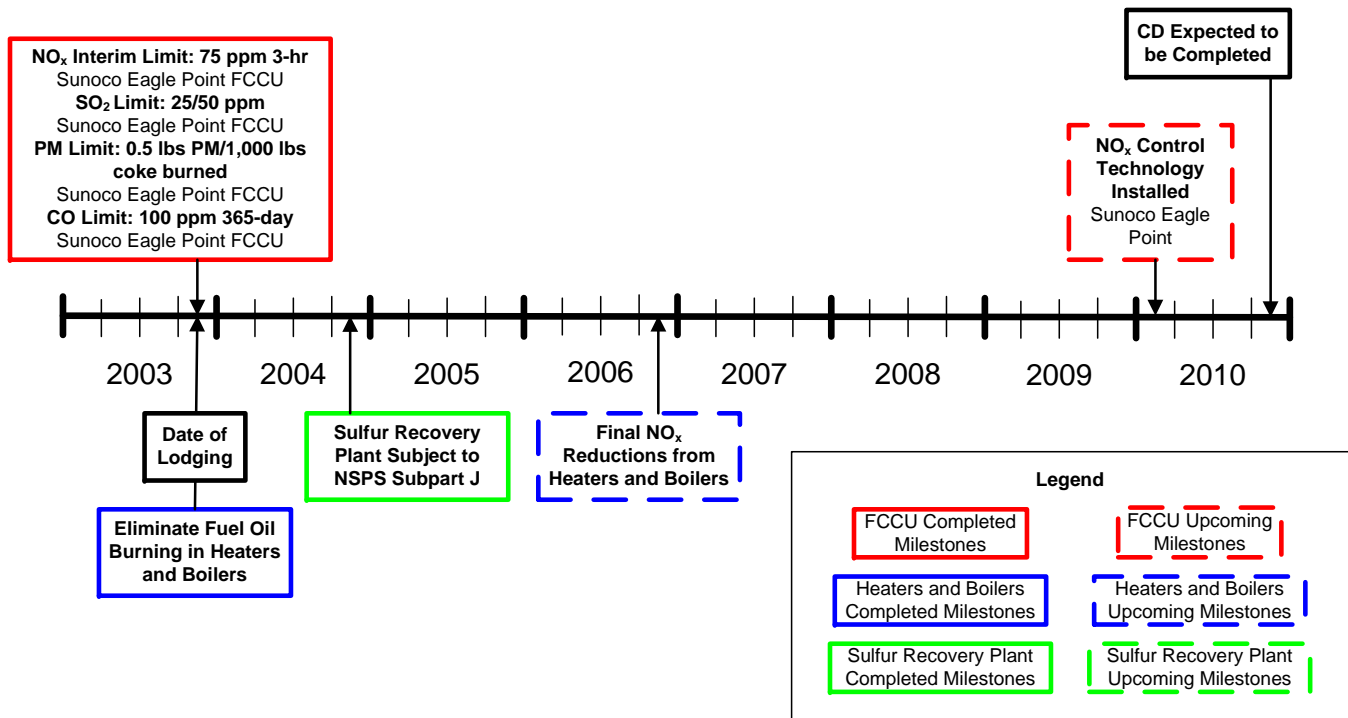
# CEPOC FCCU Emissions Reduction Compliance Dates

| DOL Oct 2003                               | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Sunoco Eagle Point<br>FCCU SO <sub>2</sub> |      |      |      | ■    |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>                       |      |      | △    | ■    |      |      |      |      |      |      | ▲▲   |      |      |      |      |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

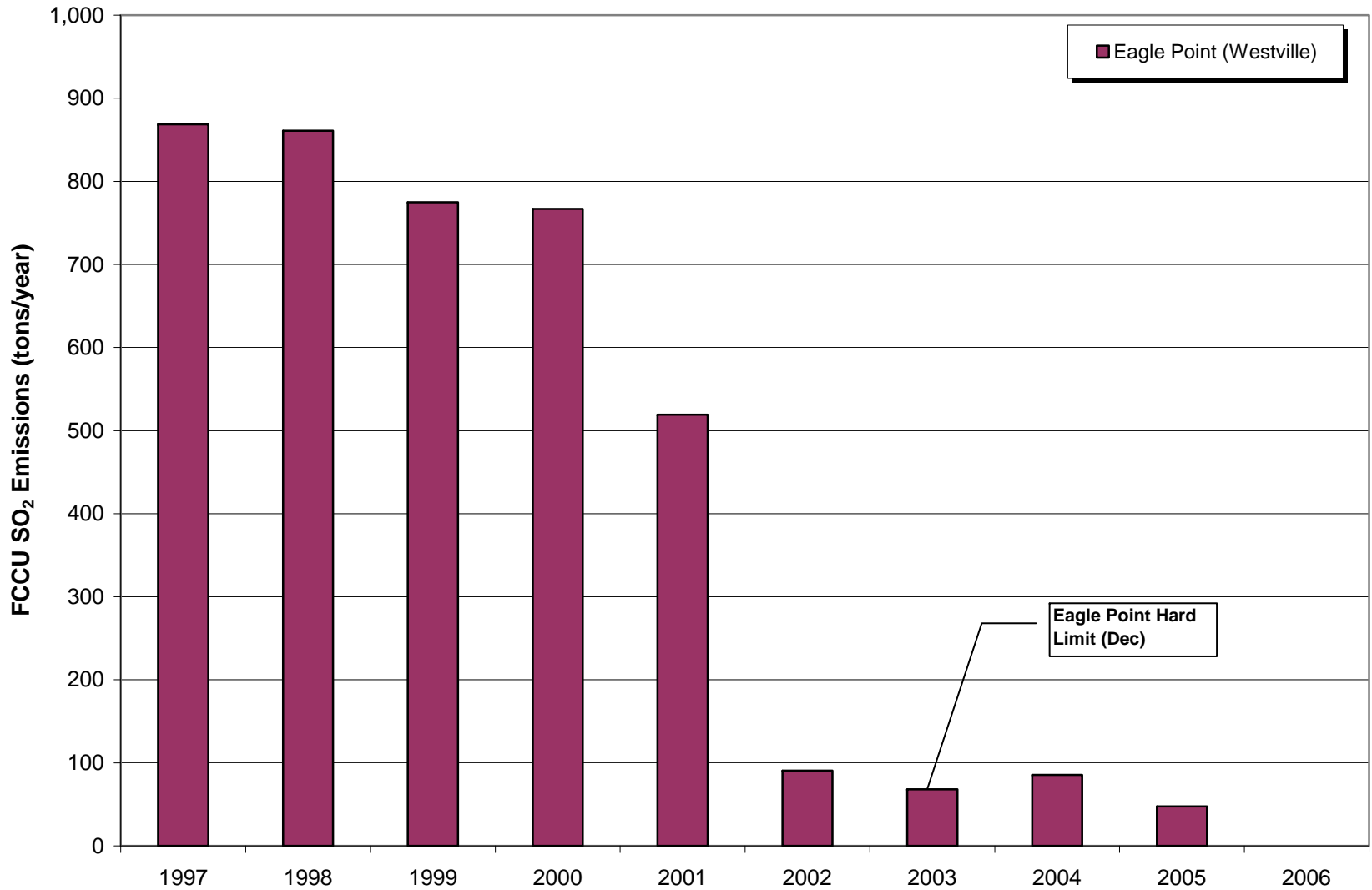


# CEPOC Emissions Controls Milestones



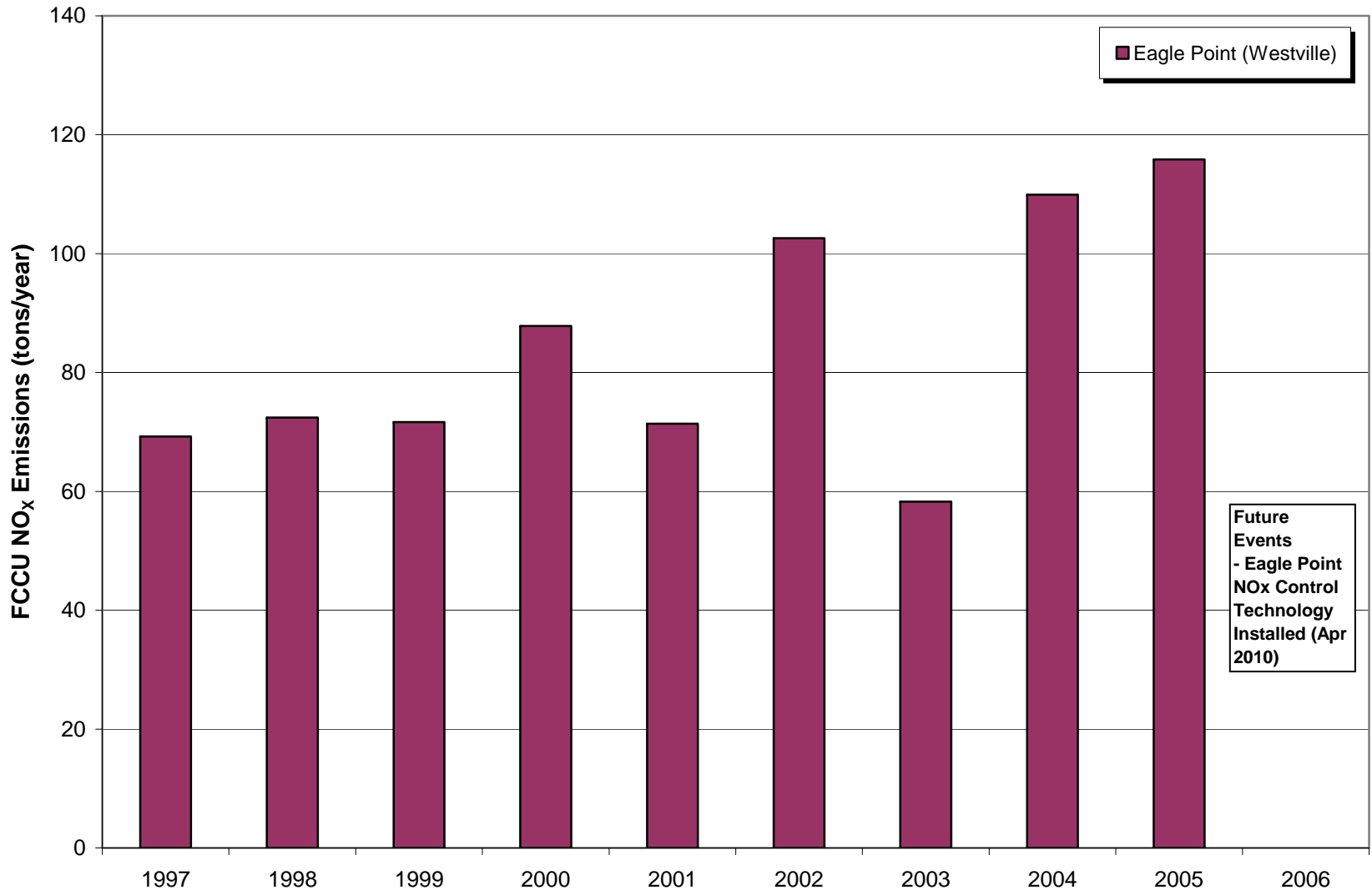
# Coastal Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 9/30/2003



# Coastal Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 9/30/2003



# Chevron

October 2003

- 5 refineries in California, Hawaii, Mississippi and Utah
- \$275 million in injunctive relief
- Annual Reductions
  - 3,300 tons of NO<sub>x</sub>
  - 6,300 tons of SO<sub>2</sub>
- Penalty: \$3.5 million
- SEPs: \$4 million
- Co-Plaintiffs: Bay Area Air Quality Management District, Hawaii, Mississippi Commission on Environmental Quality, and Utah

# Chevron FCCU Emissions Reduction Compliance Dates

|                | DOL Oct 2003         | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008           | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------|----------------------|------|------|------|------|------|------|------|----------------|------|------|------|------|------|------|------|
| El Segundo     | FCCU SO <sub>2</sub> |      |      |      | □    | ■    |      |      |                |      |      |      |      |      |      |      |
|                | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      | ▲              |      |      |      |      |      |      |      |
| Hawaii         | FCCU SO <sub>2</sub> |      |      |      |      |      | □    | □    |                |      |      |      | ■    |      |      |      |
|                | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      | ▲              |      |      |      | ▲    |      |      |      |
| Pascagoula     | FCCU SO <sub>2</sub> |      |      |      |      | □    |      | ■    |                |      |      |      |      |      |      |      |
|                | FCCU NO <sub>x</sub> |      |      |      |      | ▲    |      |      | ▲              |      |      |      |      |      |      |      |
| Richmond       | FCCU SO <sub>2</sub> |      |      |      |      |      | ■    |      |                |      |      |      |      |      |      |      |
|                | FCCU NO <sub>x</sub> |      |      |      | ▲    |      |      |      |                |      |      |      |      |      |      |      |
| Salt Lake City | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      | ■ <sup>1</sup> |      |      |      |      |      |      |      |
|                | FCCU NO <sub>x</sub> |      |      |      |      |      |      | ▲    |                |      |      |      | ▲    |      |      |      |

Notes:

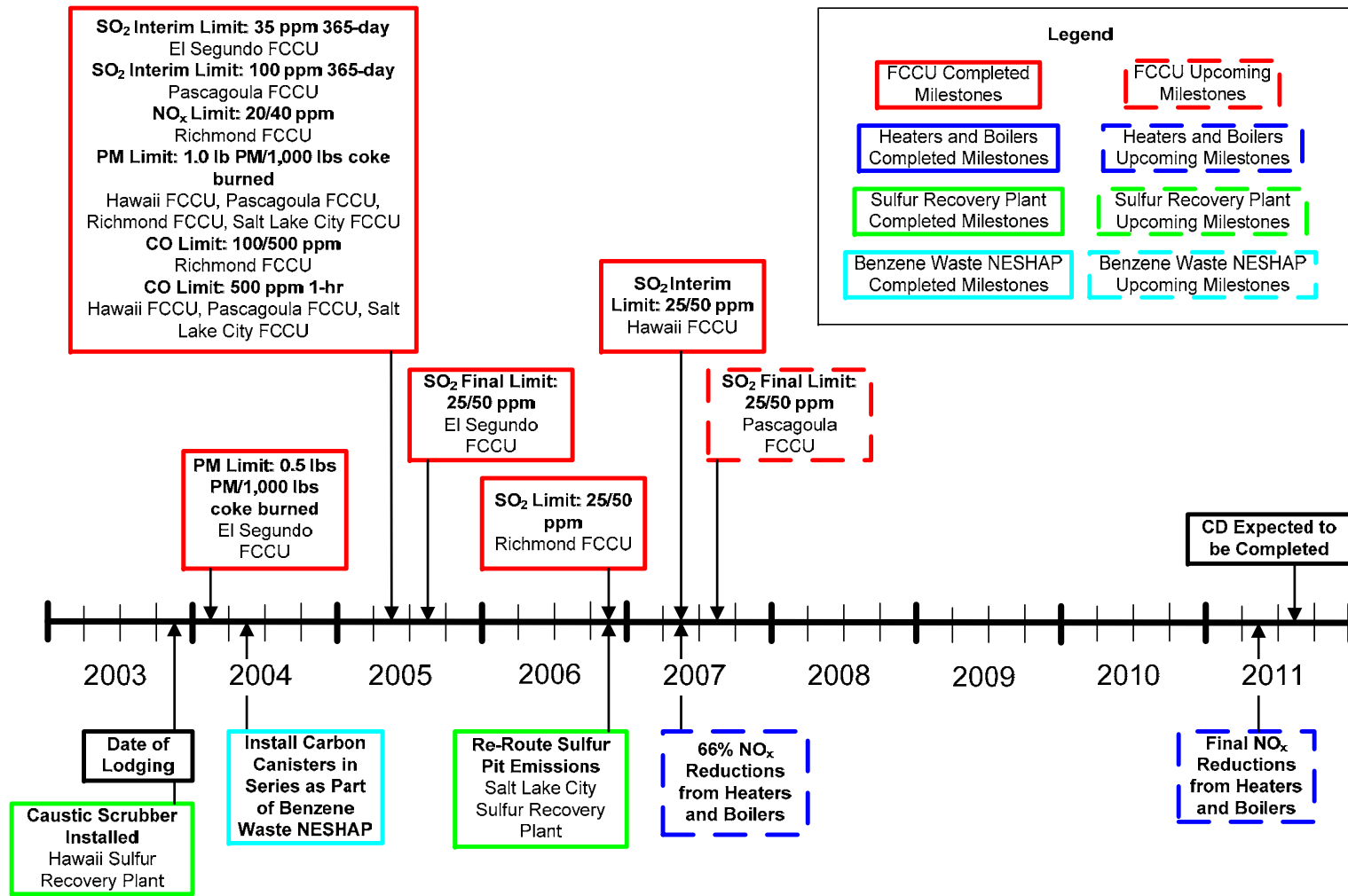
SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO<sub>x</sub>: ▲ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NO<sub>x</sub> COPS, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:

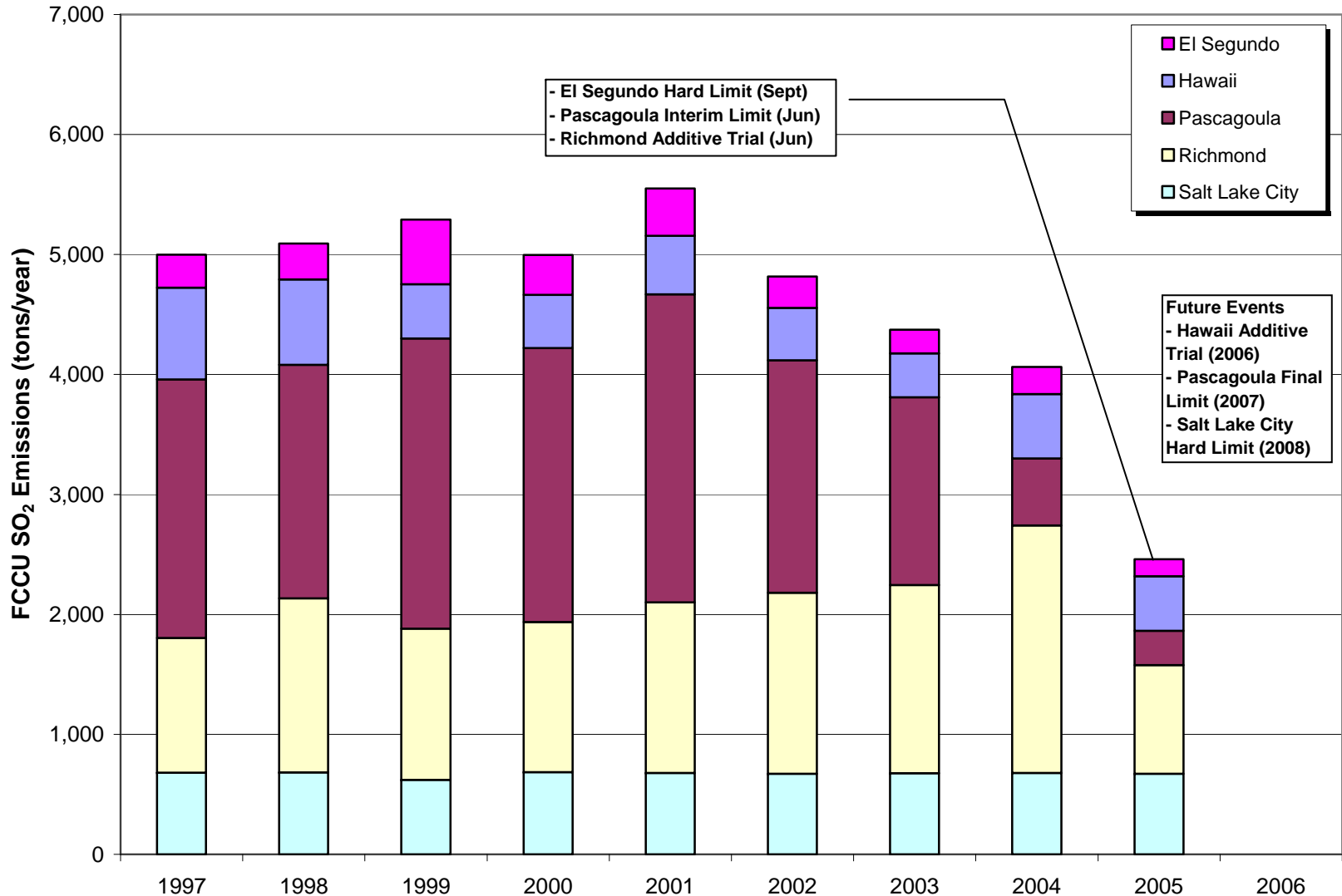
<sup>1</sup>Salt Lake City: If feed hydrotreating and SO<sub>2</sub> additives are unable to meet the 12/2008 hard limit, WGS must be used to meet the hard limit by 12/2010.

# Chevron Emissions Controls Milestones



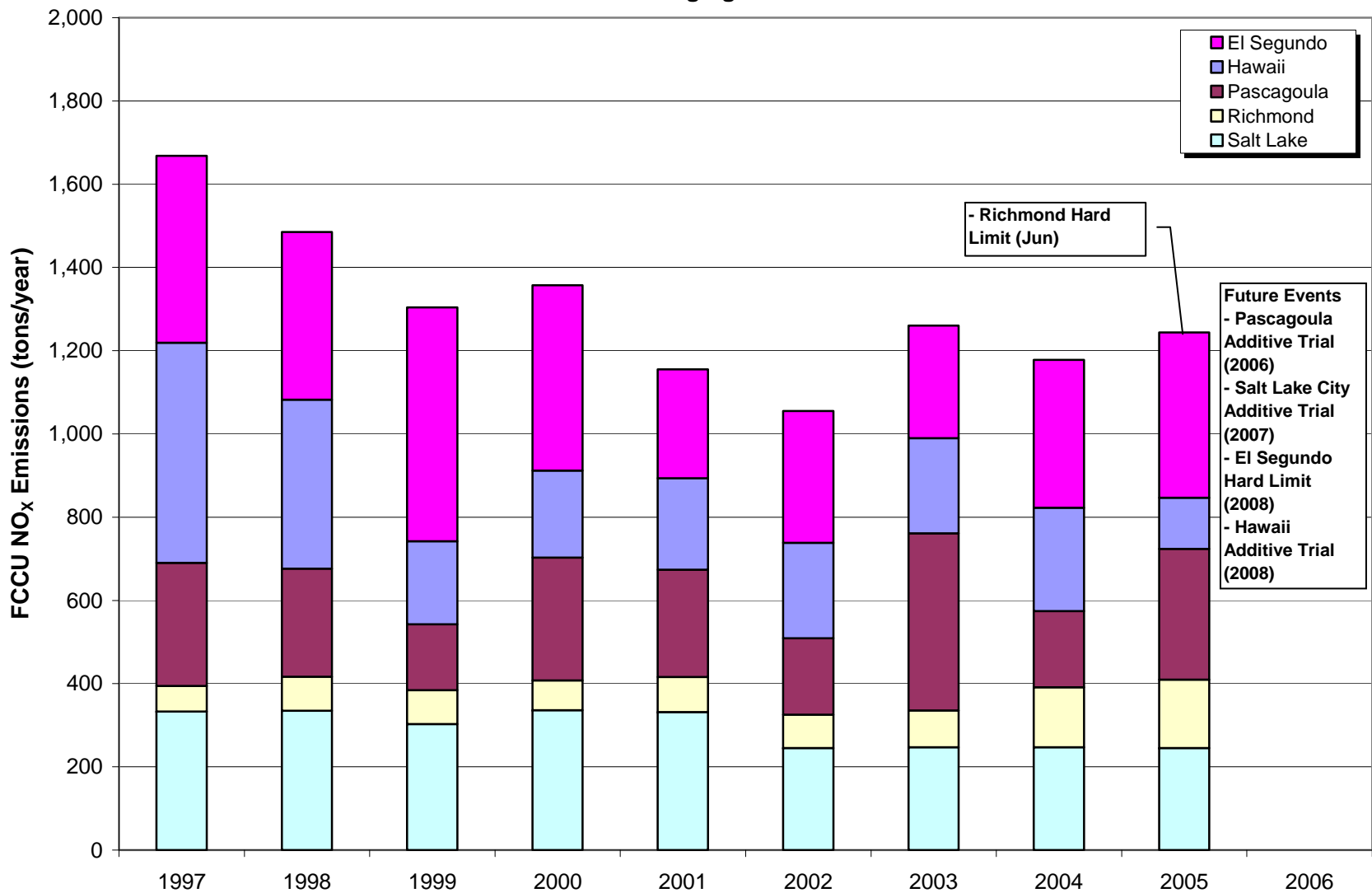
# Chevron Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 10/16/2003



# Chevron Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 10/16/2003





# CITGO

October 2004

- 5 refineries in Georgia, Illinois, Louisiana, New Jersey and Texas
- \$320 million in injunctive relief
- Annual Reductions
  - 7,100 tons of NO<sub>x</sub>
  - 23,250 tons of SO<sub>2</sub>
- Penalty: \$3.6 million
- SEPs: \$5 million
- Co-Plaintiffs: Georgia, Illinois, Louisiana and New Jersey

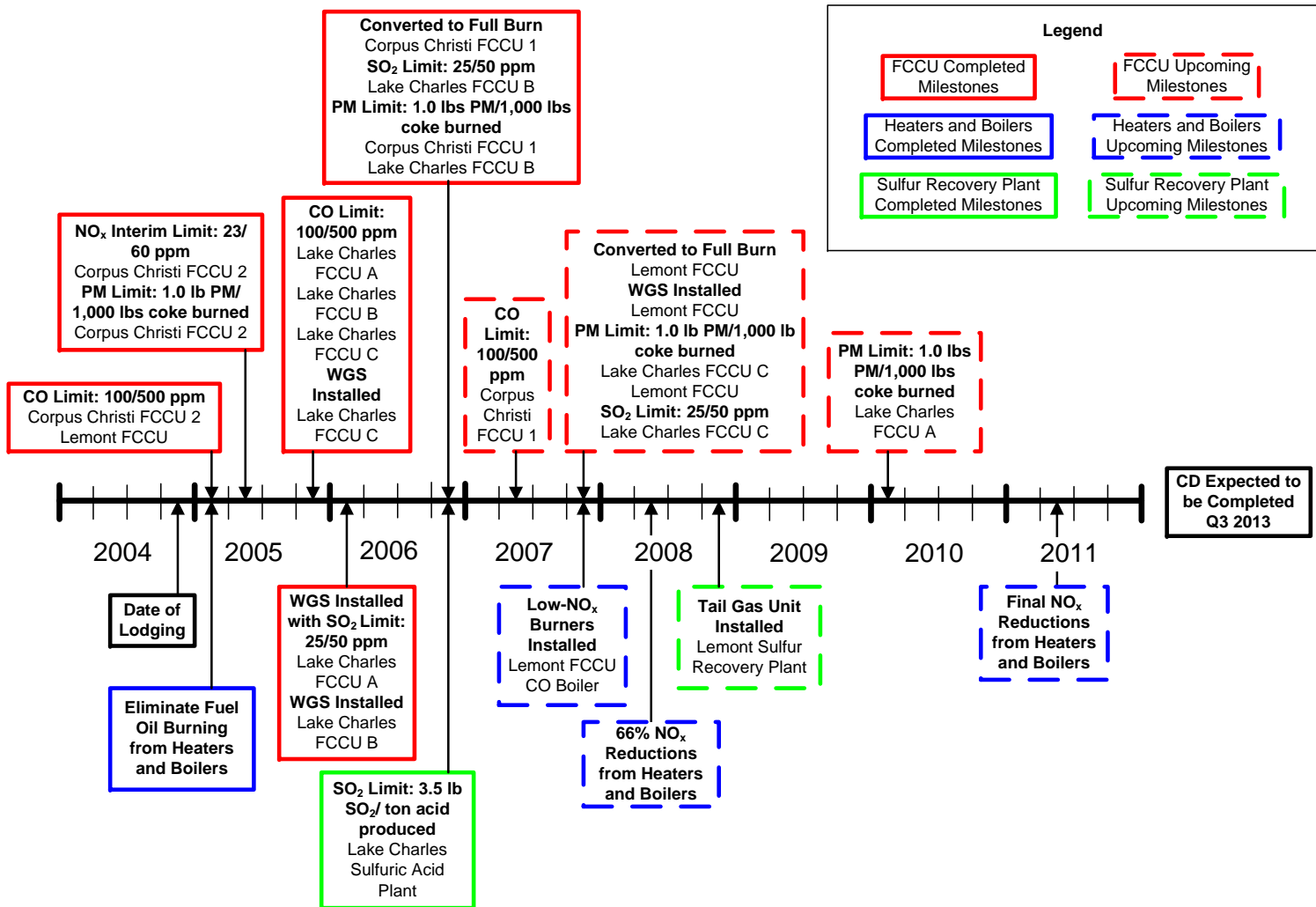
# CITGO FCCU Emissions Reduction Compliance Dates

| DOL Oct 2004          | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Corpus Christi East 1 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>  |      |      |      |      |      |      |      |      |      | □    |      |      |      |      | ■    |
| FCCU NO <sub>x</sub>  |      |      |      |      |      |      |      | △    |      |      |      |      |      |      | ▲    |
| Corpus Christi East 2 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>  |      |      |      |      |      |      | □    |      |      |      |      |      |      |      | ■    |
| FCCU NO <sub>x</sub>  |      |      |      |      | △    |      | ▲    |      |      |      |      |      |      |      |      |
| Lake Charles A        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>  |      |      |      |      |      | □    | ■    |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>  |      |      |      |      |      |      | △    |      |      |      |      |      |      |      | ▲    |
| Lake Charles B        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>  |      |      |      |      |      | □    | ■    |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>  |      |      |      |      |      |      | △    |      |      |      |      |      |      |      | ▲    |
| Lake Charles C        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>  |      |      |      |      |      | □    | ■    |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>  |      |      |      |      |      |      | △    |      |      |      |      |      |      |      | ▲    |
| Lemont                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub>  |      |      |      |      |      |      | □    | ■    |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub>  |      |      |      |      |      |      |      |      | △    |      |      |      |      |      | ▲    |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NO<sub>x</sub> COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

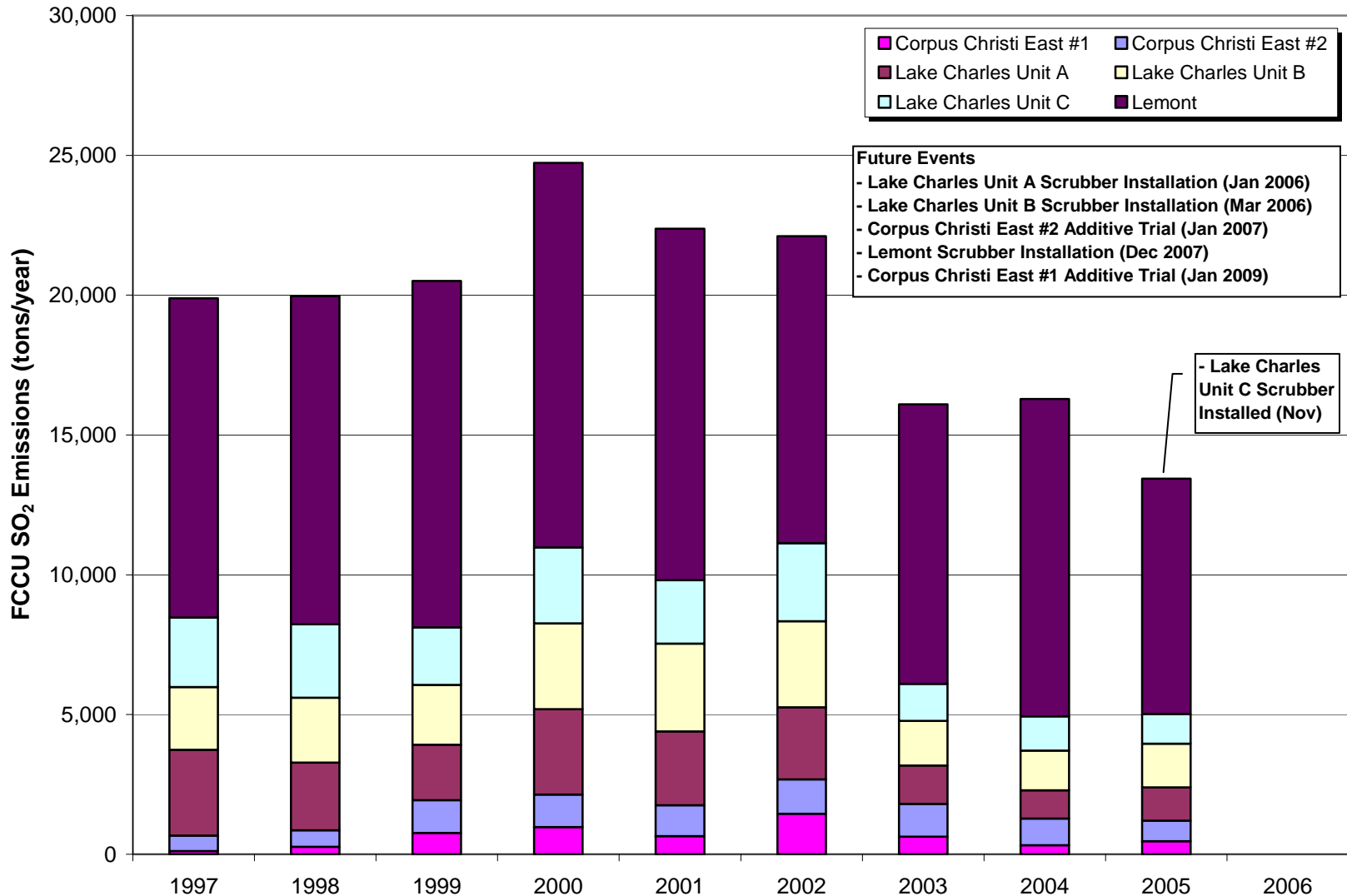
Footnotes:  
 Lemont: If FCCU is not converted to full-burn, hard limits are effective 12/31/2007.

# CITGO Emissions Controls Milestones



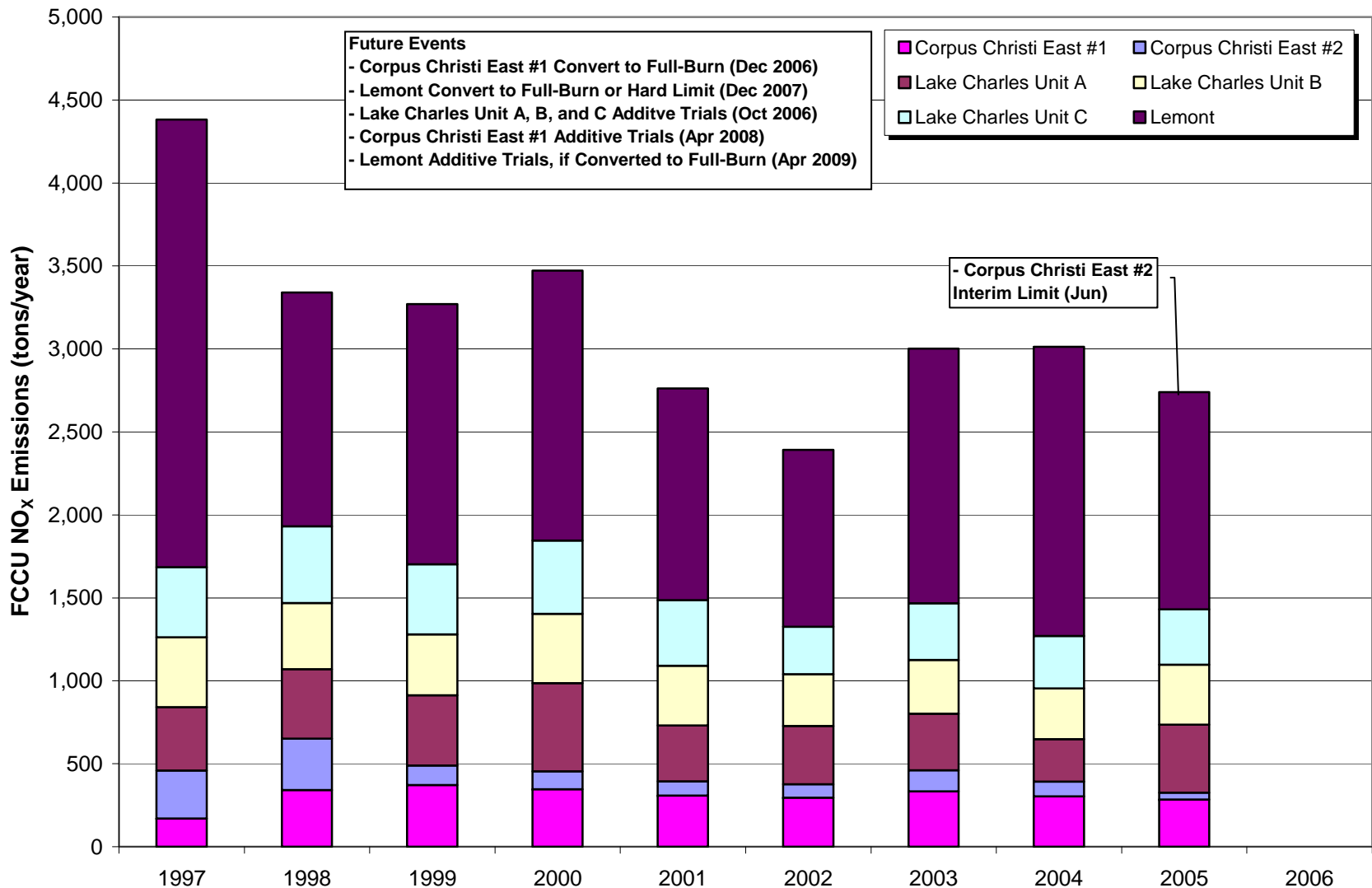
# CITGO Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 10/6/2004



# CITGO Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 10/6/2004



# ConocoPhillips

January 2005

- 11 refineries in California, Illinois, Louisiana, New Jersey, Pennsylvania, Texas and Washington
- \$525 million in injunctive relief
- Annual Reductions
  - 10,000 tons of NO<sub>x</sub>
  - 37,100 tons of SO<sub>2</sub>
- Penalty: \$4.5 million
- SEPs: \$10 million
- Co-Plaintiffs: Commonwealth of Pennsylvania, Illinois, Louisiana, New Jersey, and Northwest Clean Air Agency

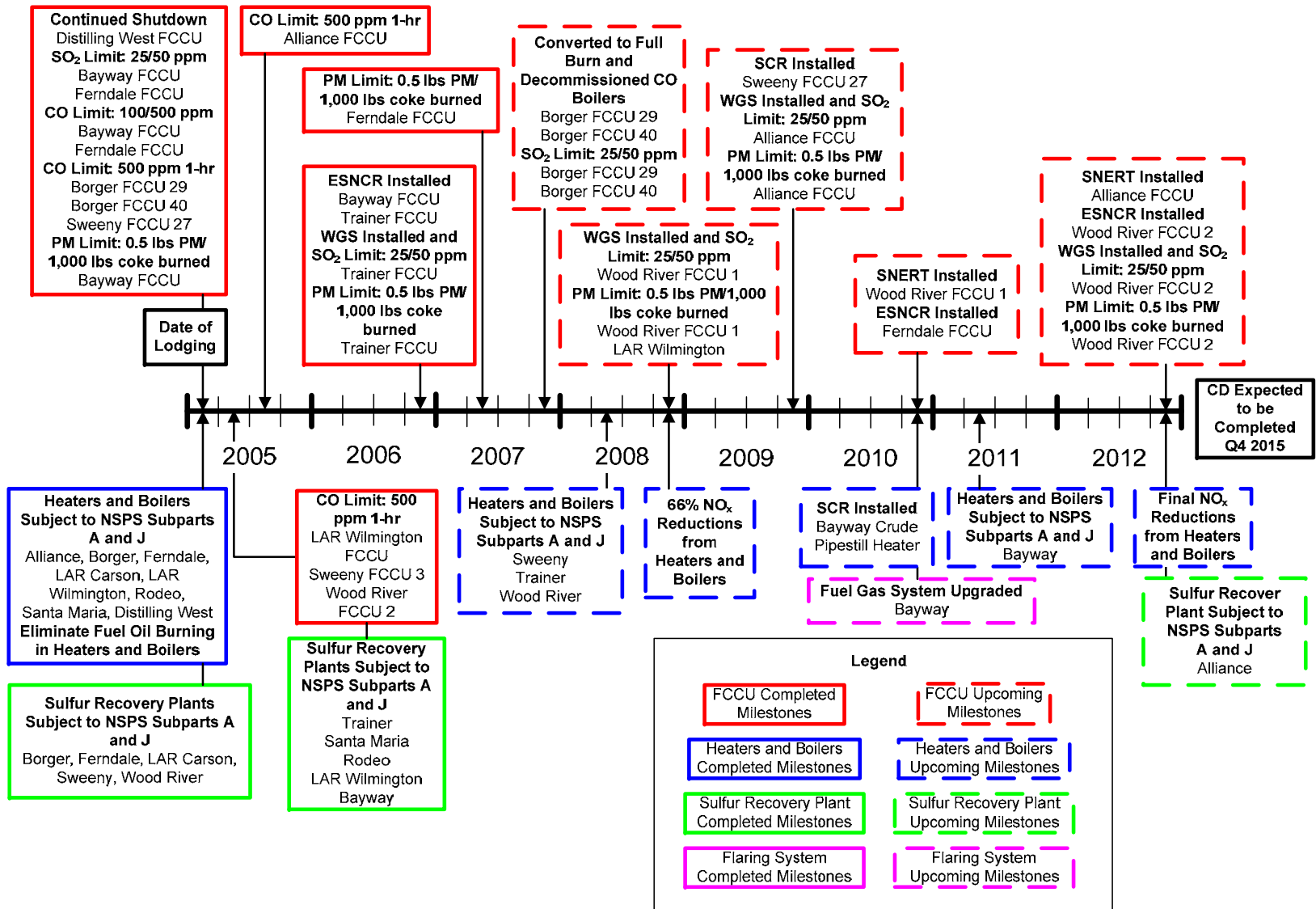
# ConocoPhillips FCCU Emissions Reduction Compliance Dates

| DOL Jan 2005           |                      | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007           | 2008 | 2009 | 2010 | 2011 | 2012 | 2013           | 2014 | 2015           |
|------------------------|----------------------|------|------|------|------|------|------|----------------|------|------|------|------|------|----------------|------|----------------|
| Alliance               | FCCU SO <sub>2</sub> |      |      |      |      |      |      |                |      | □■   |      |      |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      |      |                |      |      |      |      | △    |                |      | ▲ <sup>1</sup> |
| Bayway                 | FCCU SO <sub>2</sub> |      |      |      |      | ■    |      |                |      |      |      |      |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      | △    |                |      | ▲    |      |      |      |                |      |                |
| Borger 29              | FCCU SO <sub>2</sub> |      |      |      |      |      |      | ■ <sup>2</sup> |      |      |      |      |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      |      |                | △    |      |      |      |      | ▲ <sup>3</sup> |      |                |
| Borger 40              | FCCU SO <sub>2</sub> |      |      |      |      |      |      | ■ <sup>2</sup> |      |      |      |      |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      |      |                | △    |      |      |      |      | ▲ <sup>3</sup> |      |                |
| Ferndale               | FCCU SO <sub>2</sub> |      |      |      |      | ■    |      |                |      |      |      |      |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      |      |                |      |      |      | △    |      |                | ▲    |                |
| Los Angeles-Wilmington | FCCU SO <sub>2</sub> |      |      |      |      |      |      | □              |      |      |      | ■    |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      | △    |                |      |      |      | ▲    |      |                |      |                |
| Sweeny 3               | FCCU SO <sub>2</sub> |      |      |      |      |      |      |                |      | □    |      |      | ■    |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      |      |                |      | △▲   |      |      |      |                |      |                |
| Sweeny 27              | FCCU SO <sub>2</sub> |      |      |      |      |      |      | □              |      |      | ■    |      |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      |      | △              |      |      |      |      |      | ▲              |      |                |
| Trainer                | FCCU SO <sub>2</sub> |      |      |      |      |      | □■   |                |      |      |      |      |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      | △    |                |      | ▲    |      |      |      |                |      |                |
| Wood River 1           | FCCU SO <sub>2</sub> |      |      |      |      |      |      |                | □■   |      |      |      |      |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      |      |                |      |      |      | △    |      |                | ▲    |                |
| Wood River 2           | FCCU SO <sub>2</sub> |      |      |      |      |      |      |                |      |      |      |      | □■   |                |      |                |
|                        | FCCU NO <sub>x</sub> |      |      |      |      |      |      |                |      |      |      |      |      | △              |      | ▲              |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: △ = interim hard limit, ▲ = hard limits, △ = hardware installation, ▲ = hardware limits effective, △ = start of additives and/or low NO<sub>x</sub> COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

Footnotes:  
<sup>1</sup>Alliance: If SNERT is installed, compliance date is 3/2015; if SNERT is not installed, compliance date is 12/2009.  
<sup>2</sup>Borger 29, Borger 40: ConocoPhillips notified EPA pursuant to paragraph 58 that the CO boilers will be decommissioned, the FCCUs converted to full burn, and the FCCU feed high pressure hydrotreated. ConocoPhillips will take SO<sub>2</sub> hard limits.  
<sup>3</sup>Borger 29, Borger 40: ConocoPhillips notified EPA pursuant to paragraph 39 that the CO boilers will be decommissioned, the FCCUs converted to full burn, and the FCCU feed high pressure hydrotreated. ConocoPhillips will implement a NO<sub>x</sub> additive program.

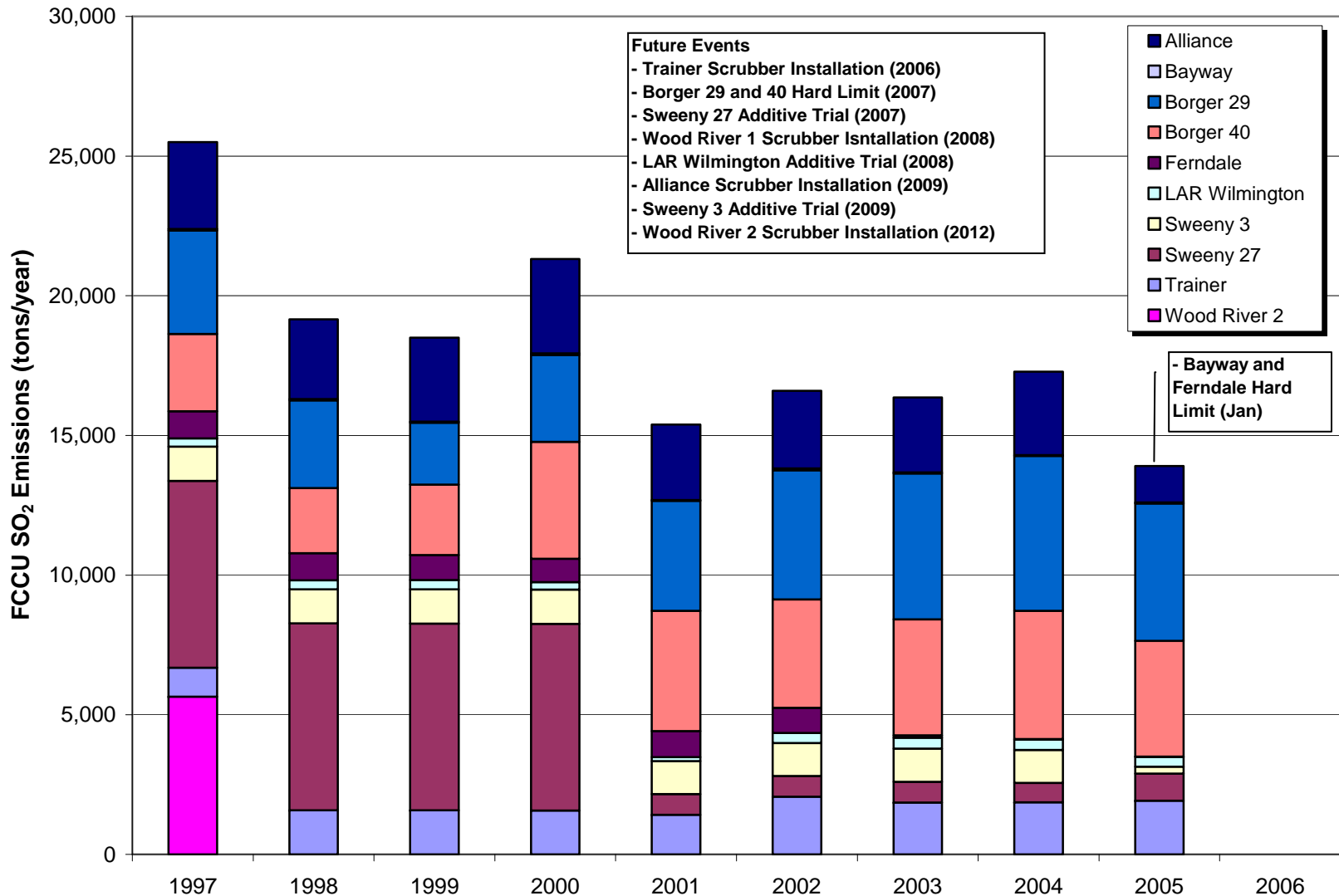
# ConocoPhillips Emissions Controls Milestones





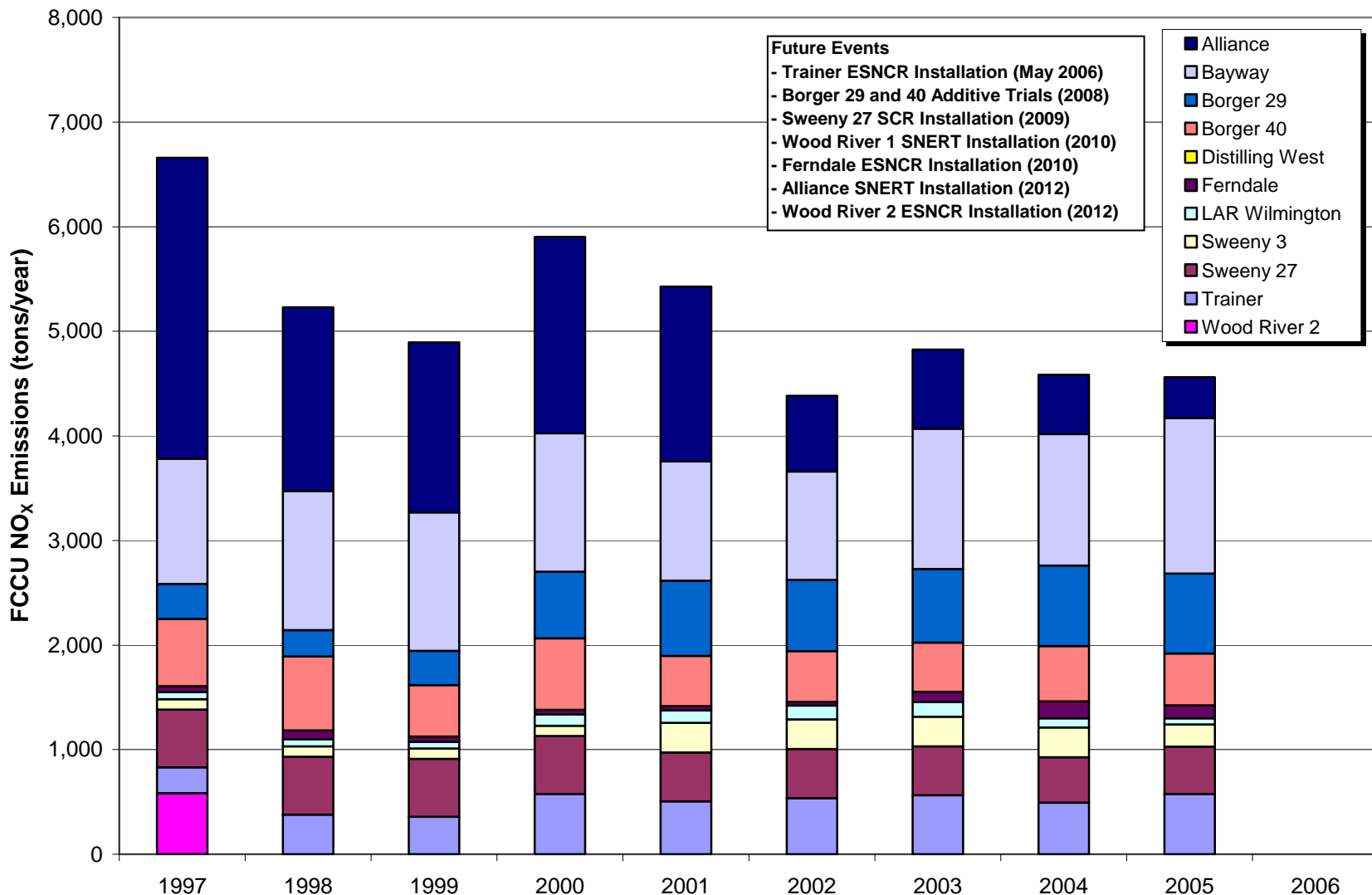
# ConocoPhillips Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 1/27/2005



# ConocoPhillips Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 1/27/2005



# Sunoco

June 2005

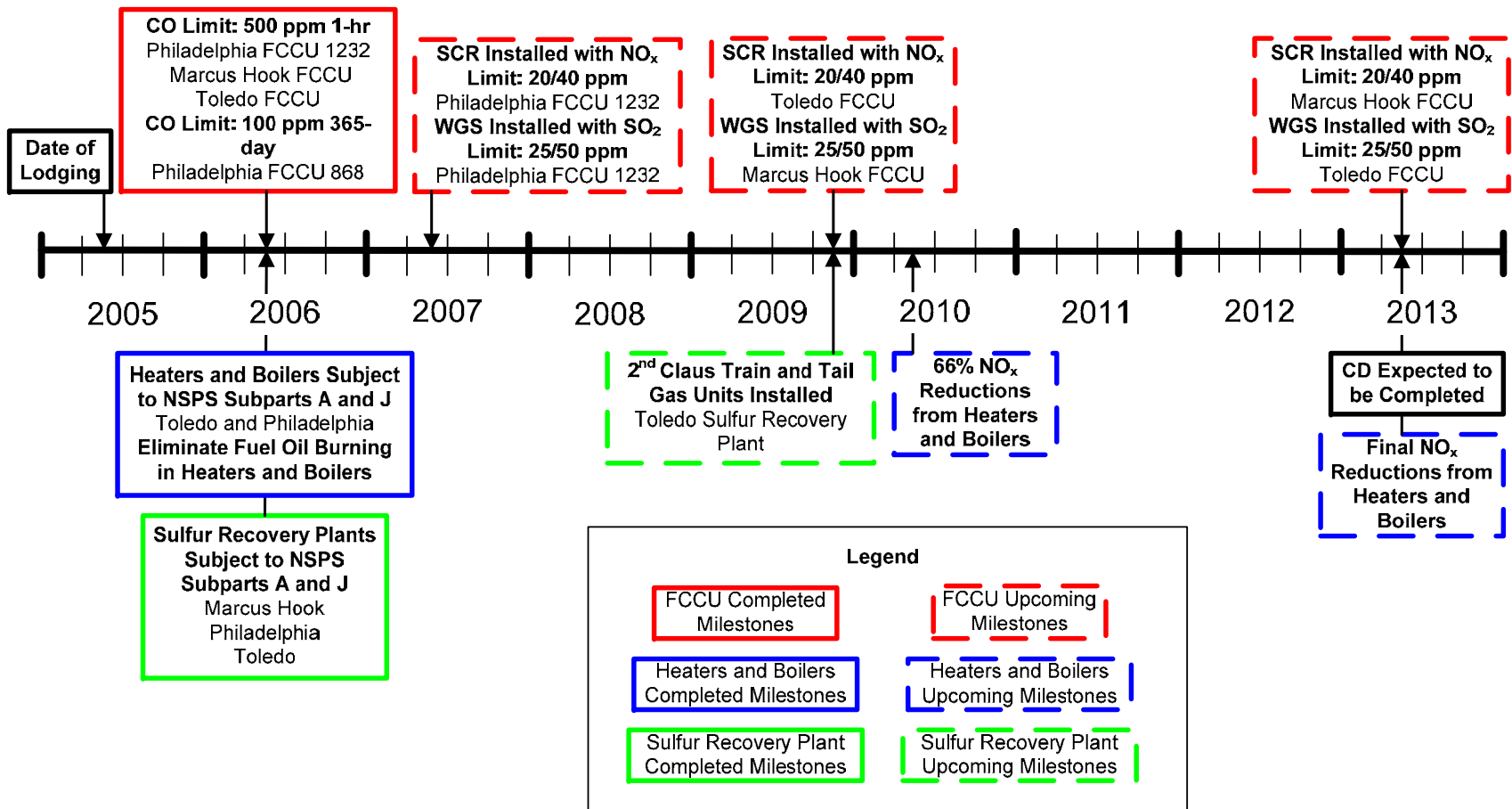
- 4 refineries in Ohio, Oklahoma and Pennsylvania
- \$350 million in injunctive relief
- Annual Reductions
  - 49,500 tons of NO<sub>x</sub>
  - 19,500 tons of SO<sub>2</sub>
- Penalty: \$3 million
- SEPs: \$3.9 million
- Co-Plaintiffs: City of Philadelphia, Ohio, Oklahoma, and Pennsylvania

# Sunoco FCCU Emissions Reduction Compliance Dates

| DOL Jun 2005         | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Marcus Hook          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      | □■   |      |      |
| FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      | ▲    |      |      |
| Philadelphia 1232    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |      |      |      |      |      |      |      | □■   |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub> |      |      |      |      |      |      |      | ▲    |      |      |      |      |      |      |      |
| Philadelphia 868     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Toledo               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

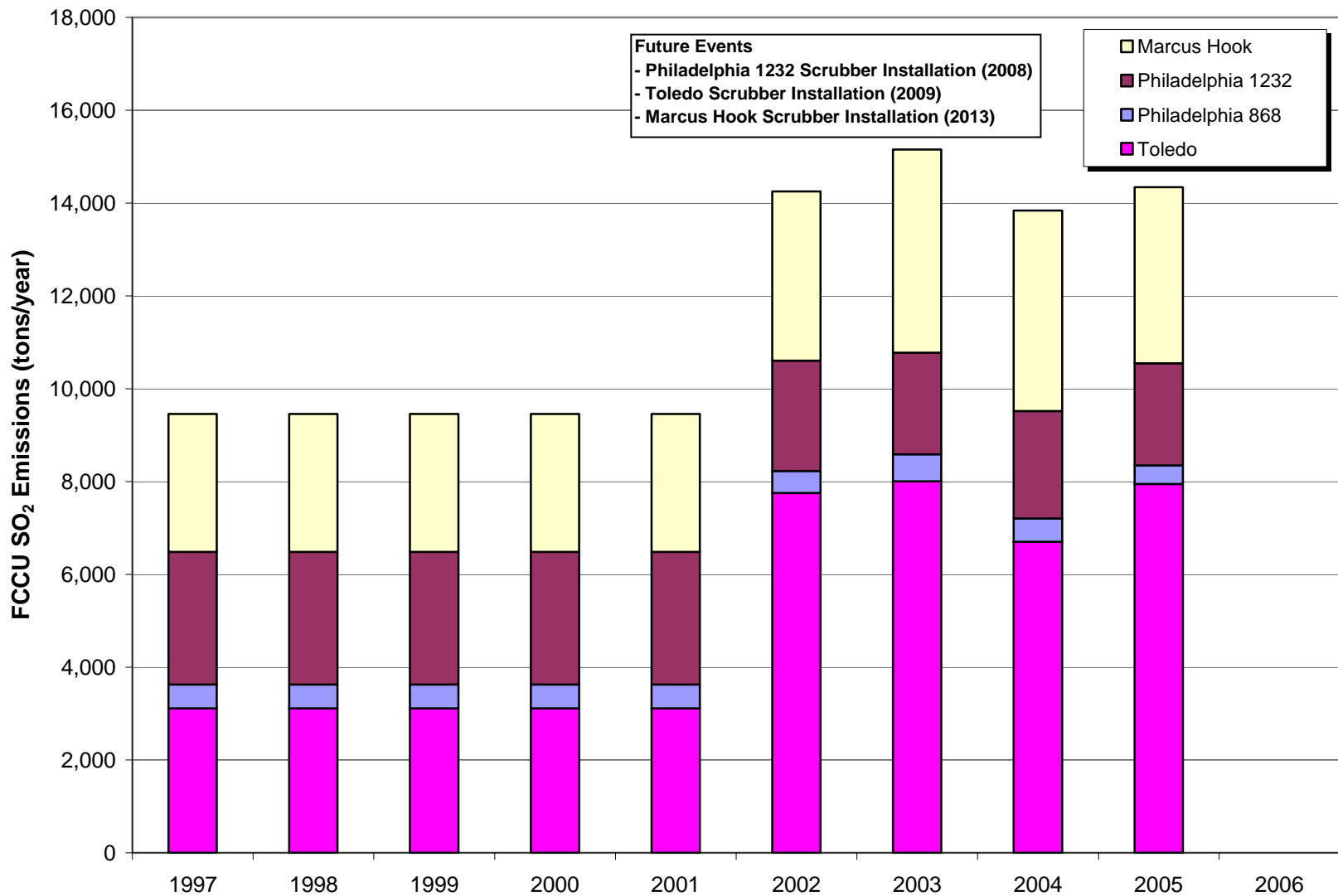
Notes:  
SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
NO<sub>x</sub>: ▲ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

# Sunoco Emissions Controls Milestones



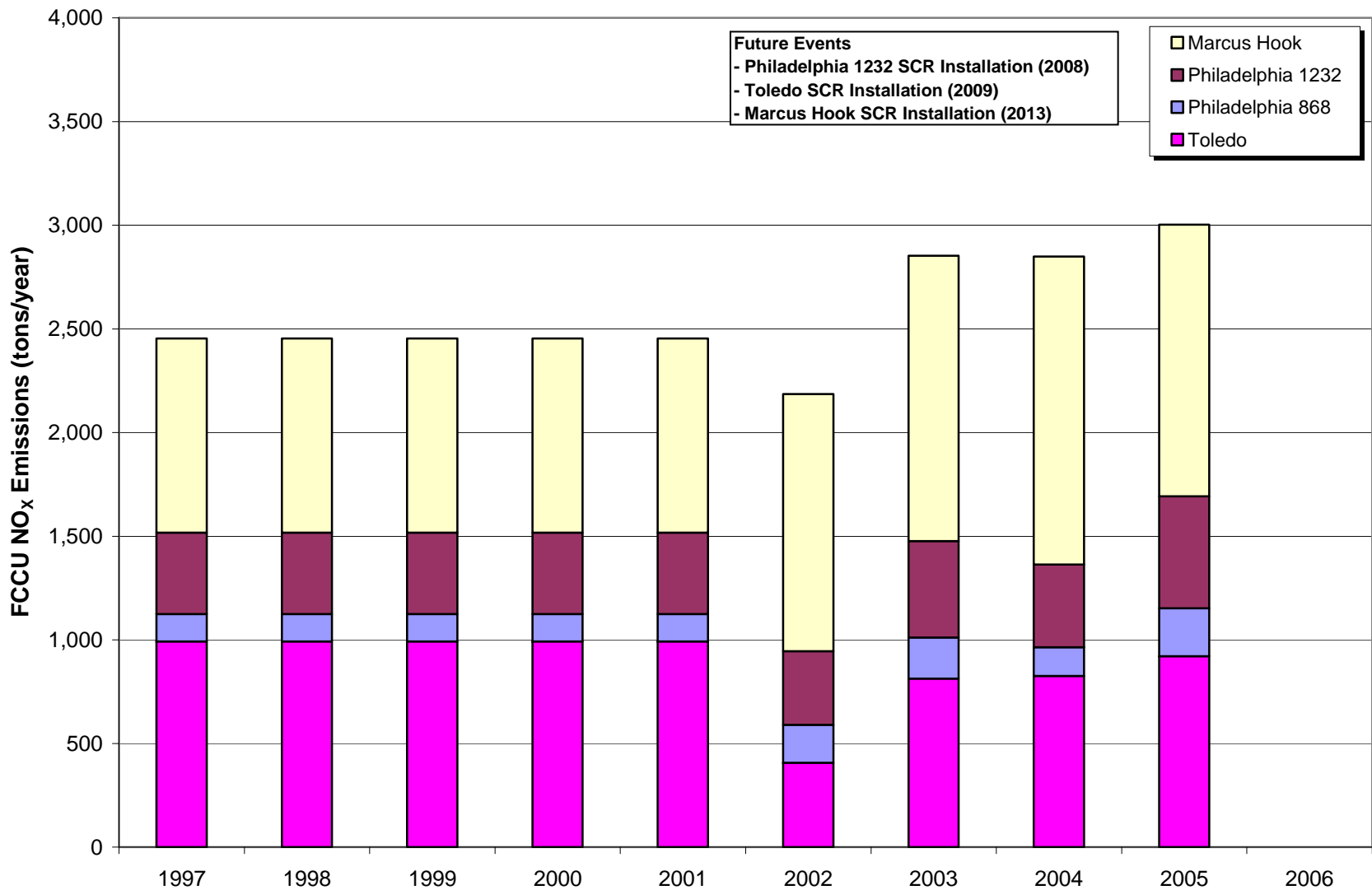
# Sunoco Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 6/16/2005



# Sunoco Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 6/16/2005



# Valero

June 2005

- 14 refineries in California, Colorado, Louisiana, New Jersey, Oklahoma and Texas
- \$700 million in injunctive relief
- Annual Reductions
  - 4,000 tons of NO<sub>x</sub>
  - 16,000 tons of SO<sub>2</sub>
- Penalty: \$5.5 million
- SEPs: \$5.5 million
- Co-Plaintiffs: Colorado, Louisiana, New Jersey, Oklahoma and Texas
- Suncor Energy (U.S.A.) Inc. acquired the Denver, Colorado refinery in 2005 (integrated with adjacent refinery previously acquired from ConocoPhillips in 2003)



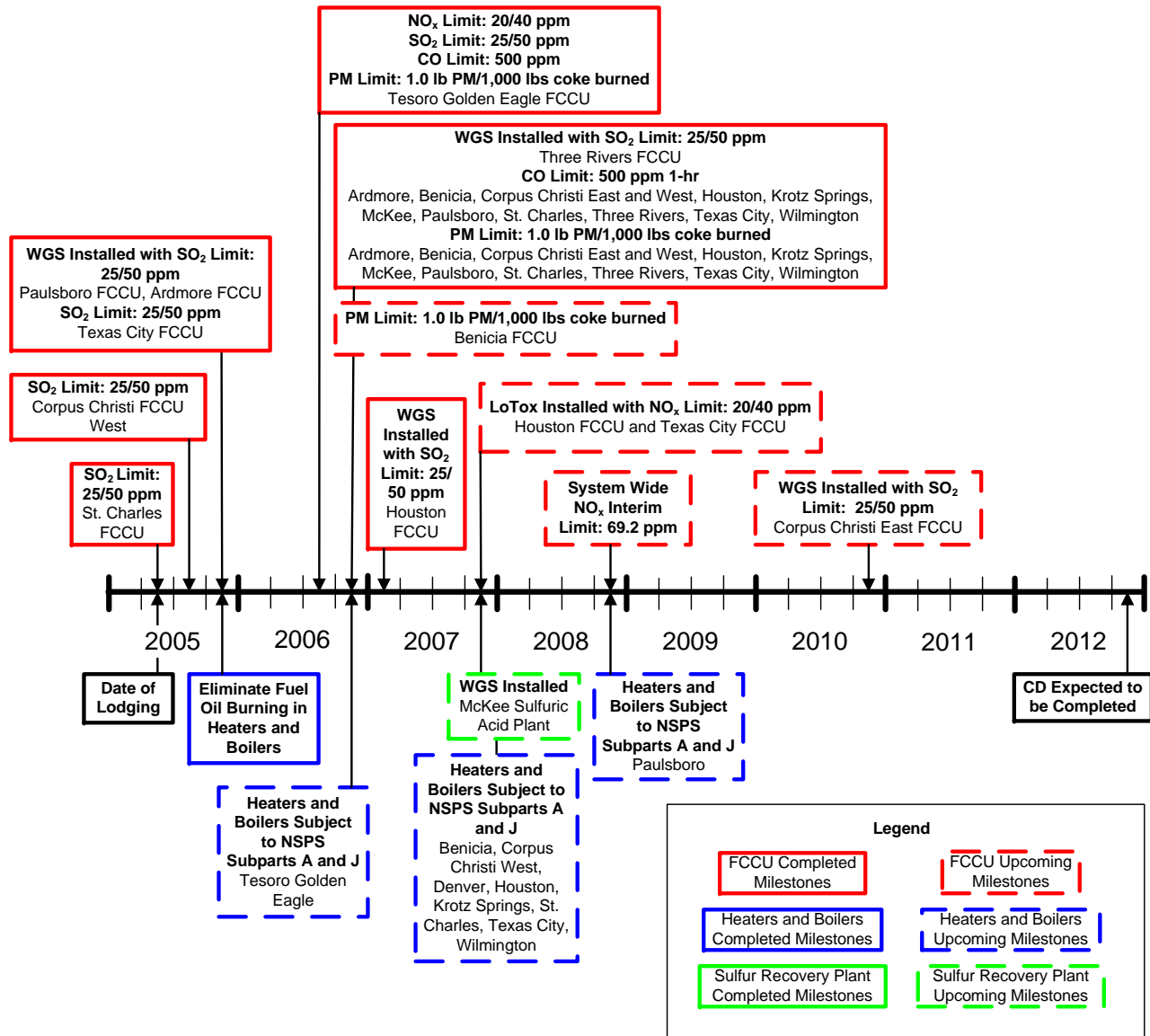
# Valero FCCU Emissions Reduction Compliance Dates

|   | DOL Jun 2005 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Ardmore<br>FCCU SO <sub>2</sub>                   |              |      |      |      |      | ■ □  |      |      |      |      |      |      |      |      |      |      |
| Benicia FCCU<br>FCCU SO <sub>2</sub>              |              |      |      |      |      |      |      |      | □    |      | ■    |      |      |      |      |      |
| Benicia Coker<br>FCCU SO <sub>2</sub>             |              |      |      |      |      |      |      |      |      |      |      | □    | ■    |      |      |      |
| Corpus Christi East<br>FCCU SO <sub>2</sub>       |              |      |      |      |      |      |      | □    |      |      | □    | ■    |      |      |      |      |
| Corpus Christi West<br>FCCU SO <sub>2</sub>       |              |      |      |      |      | ■    |      |      |      |      |      |      |      |      |      |      |
| Denver<br>FCCU SO <sub>2</sub>                    |              |      |      |      |      |      |      | □    |      |      |      | ■    |      |      |      |      |
| Houston<br>FCCU SO <sub>2</sub>                   |              |      |      |      |      |      |      | □    | ■    |      |      |      |      |      |      |      |
| Houston<br>FCCU NO <sub>x</sub>                   |              |      |      |      |      |      |      |      | ▲ ▲  |      |      |      |      |      |      |      |
| Krotz Springs<br>FCCU SO <sub>2</sub>             |              |      |      |      |      |      |      |      | □    |      |      |      | ■    |      |      |      |
| McKee FCCU<br>FCCU SO <sub>2</sub>                |              |      |      |      |      |      |      | □    |      |      |      | ■    |      |      |      |      |
| McKee Sulfuric Acid Plant<br>FCCU SO <sub>2</sub> |              |      |      |      |      |      |      |      | □    |      |      |      |      |      |      |      |
| Paulsboro<br>FCCU SO <sub>2</sub>                 |              |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |      |
| Paulsboro<br>FCCU NO <sub>x</sub>                 |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| St. Charles<br>FCCU SO <sub>2</sub>               |              |      |      |      |      | ■    |      |      |      |      |      |      |      |      |      |      |
| St. Charles<br>FCCU NO <sub>x</sub>               |              |      |      |      |      |      |      | ▲    |      |      |      |      |      |      |      |      |
| Texas City<br>FCCU SO <sub>2</sub>                |              |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |      |
| Texas City<br>FCCU NO <sub>x</sub>                |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Three Rivers<br>FCCU SO <sub>2</sub>              |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Wilmington<br>FCCU SO <sub>2</sub>                |              |      |      |      |      |      |      |      | □    |      |      |      | ■    |      |      |      |
| Wilmington<br>FCCU NO <sub>x</sub>                |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Tesoro Golden Eagle<br>FCCU SO <sub>2</sub>       |              |      |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |
| Tesoro Golden Eagle<br>FCCU NO <sub>x</sub>       |              |      |      |      |      |      |      | ▲    |      |      |      |      |      |      |      |      |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: ▲ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NO<sub>x</sub> COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

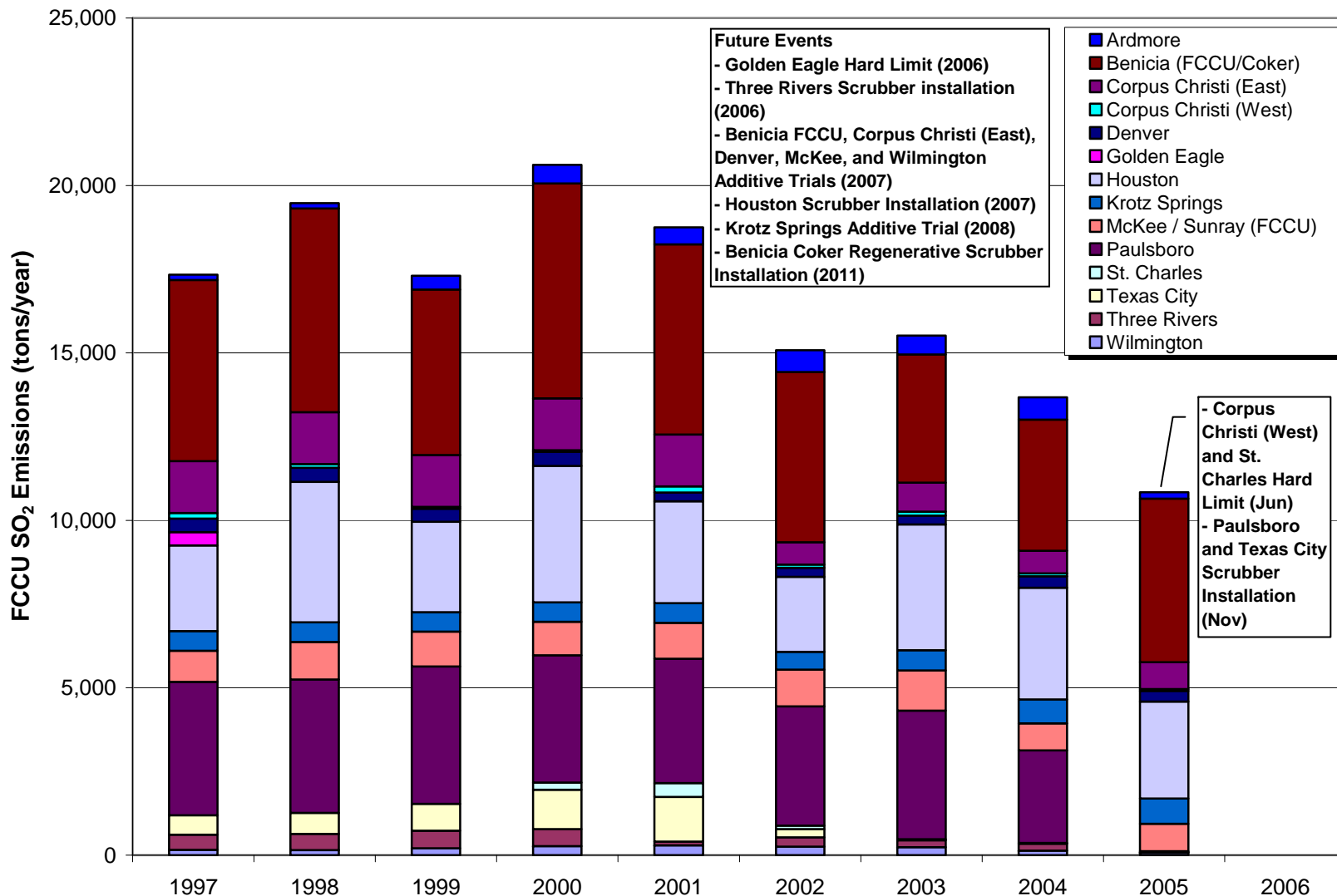
Footnotes:  
 By 12/2010 one of the ultra-low NO<sub>x</sub> regenerators at either Paulsboro, St. Charles, or Wilmington must meet hard limits for NO<sub>x</sub>.  
 System wide coke burn-weighted average NO<sub>x</sub> interim limit must be effective 3/2009 to include Ardmore, Corpus Christi East, Corpus Christi West, Denver, Houston, Krotz Springs, McKee, Paulsboro, St. Charles, Texas City, Three Rivers, Wilmington, and Tesoro Golden Eagle. The final system wide coke-burn weighted average NO<sub>x</sub> limit is effective 3/2012.

# Valero Emissions Controls Milestones



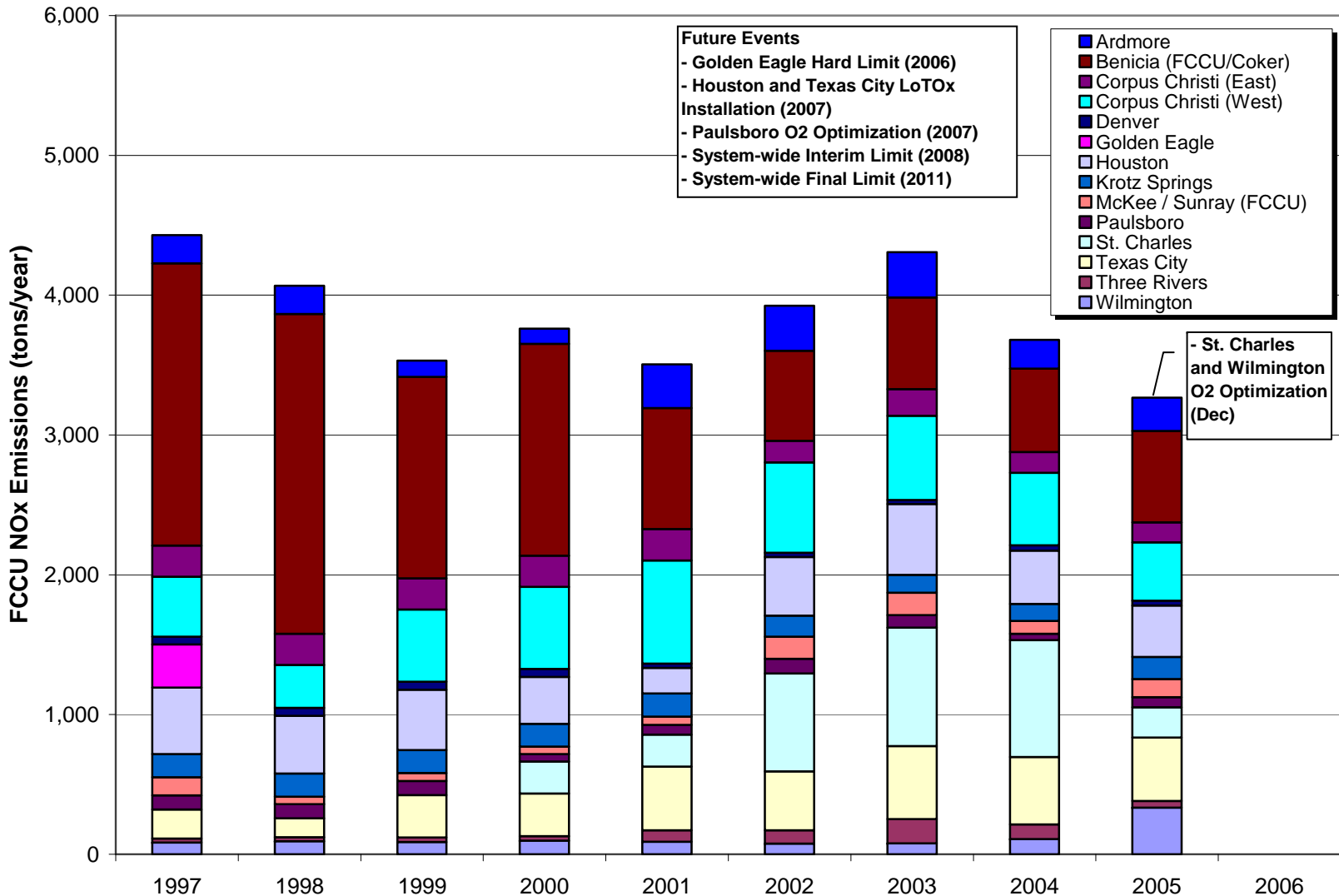
# Valero Actual FCCU SO<sub>2</sub> Emissions

Date of Lodging: 6/16/2005



# Valero Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 6/16/2005



# ExxonMobil

October 2005

- 7 refineries in California, Illinois, Louisiana, Montana and Texas
- \$570 million in injunctive relief
- Annual Reductions
  - 11,000 tons of NO<sub>x</sub>
  - 42,000 tons of SO<sub>2</sub>
- Penalty: \$8.7 million
- SEPs: \$9.7 million
- Co-Plaintiffs: Illinois, Louisiana and Montana

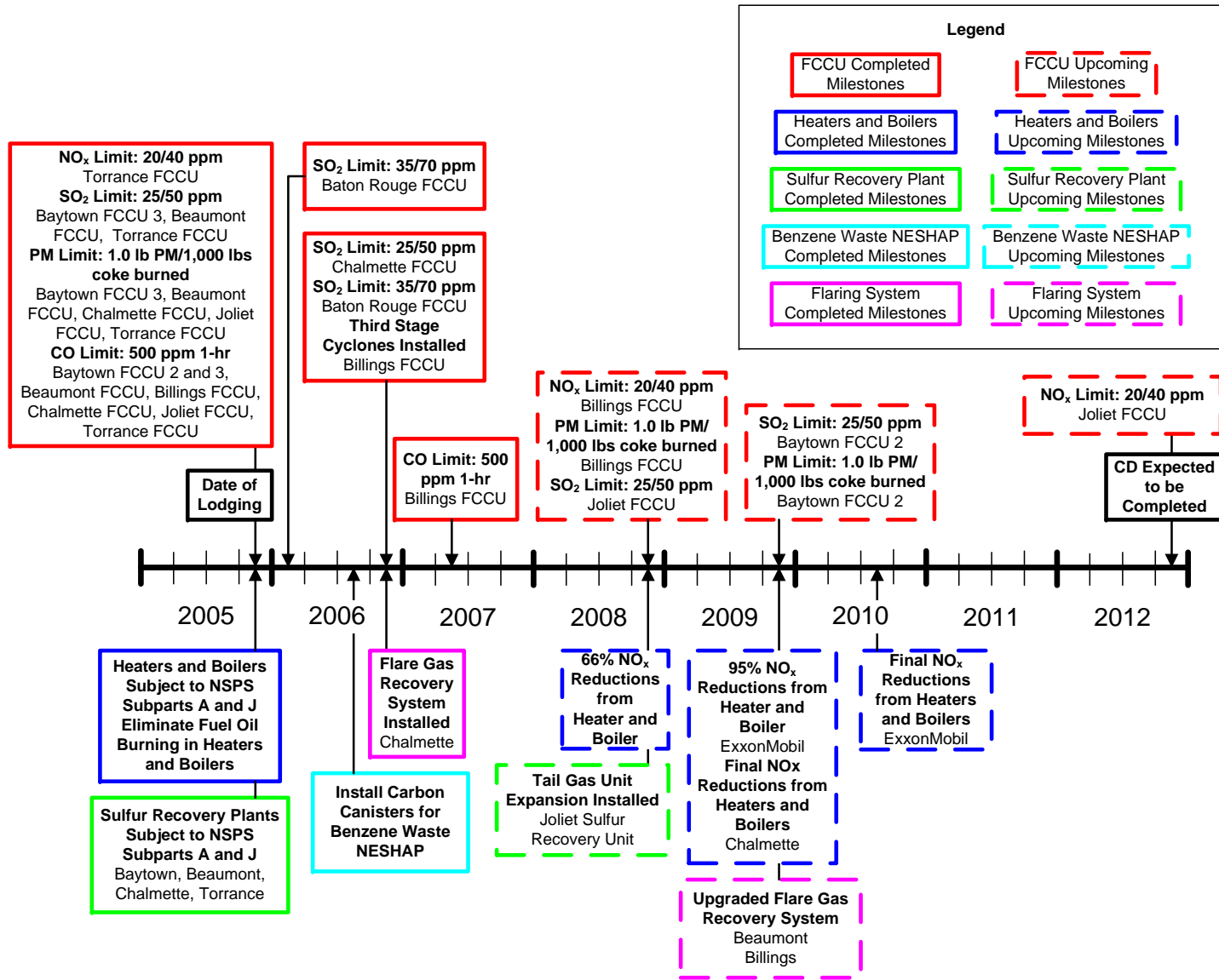
# ExxonMobil FCCU Emissions Reduction Compliance Dates

|             | DOL Oct 2005         | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Baton Rouge | FCCU SO <sub>2</sub> |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      |      |      | ▲    |      |      |      |      |      |      |      |      |
| Baytown 2   | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      | ■    |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      |      |      | ▲    |      |      |      | ▲    |      |      |      |      |
| Baytown 3   | FCCU SO <sub>2</sub> |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      |      |      | ▲    |      |      |      | ▲    |      |      |      |      |
| Beaumont    | FCCU SO <sub>2</sub> |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      | ▲    |      |      | ▲    |      |      |      |      |
| Billings    | FCCU SO <sub>2</sub> |      |      |      |      |      |      | □    |      |      |      |      |      | ■    |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      | ▲    |      |      |      |      |      |
| Joliet      | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      | ■    |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ▲    |
| Torrance    | FCCU SO <sub>2</sub> |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      |      | ▲    |      |      |      |      |      |      |      |      |      |
| Chalmette   | FCCU SO <sub>2</sub> |      |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |
|             | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ▲    |

Notes:  
 SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).  
 NO<sub>x</sub>: ▲ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NO<sub>x</sub> COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

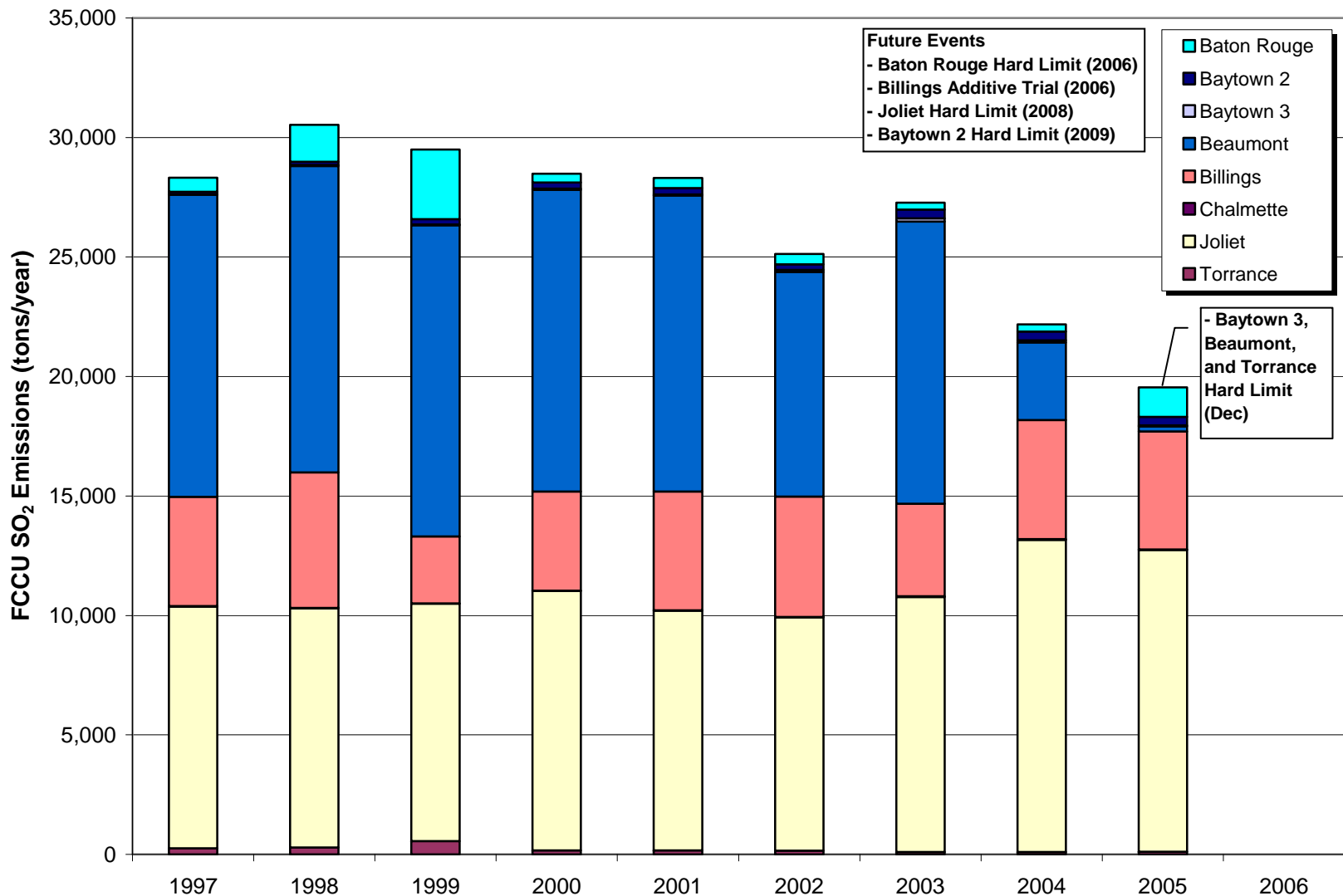
Footnotes:  
 \*Chalmette: If additives are found to be effective, compliance date is 6/30/2007, if additives are not effective, compliance date is 12/31/2008.

# ExxonMobil & Chalmette Emissions Controls Milestones



## ExxonMobil Actual FCCU SO<sub>2</sub> Emissions

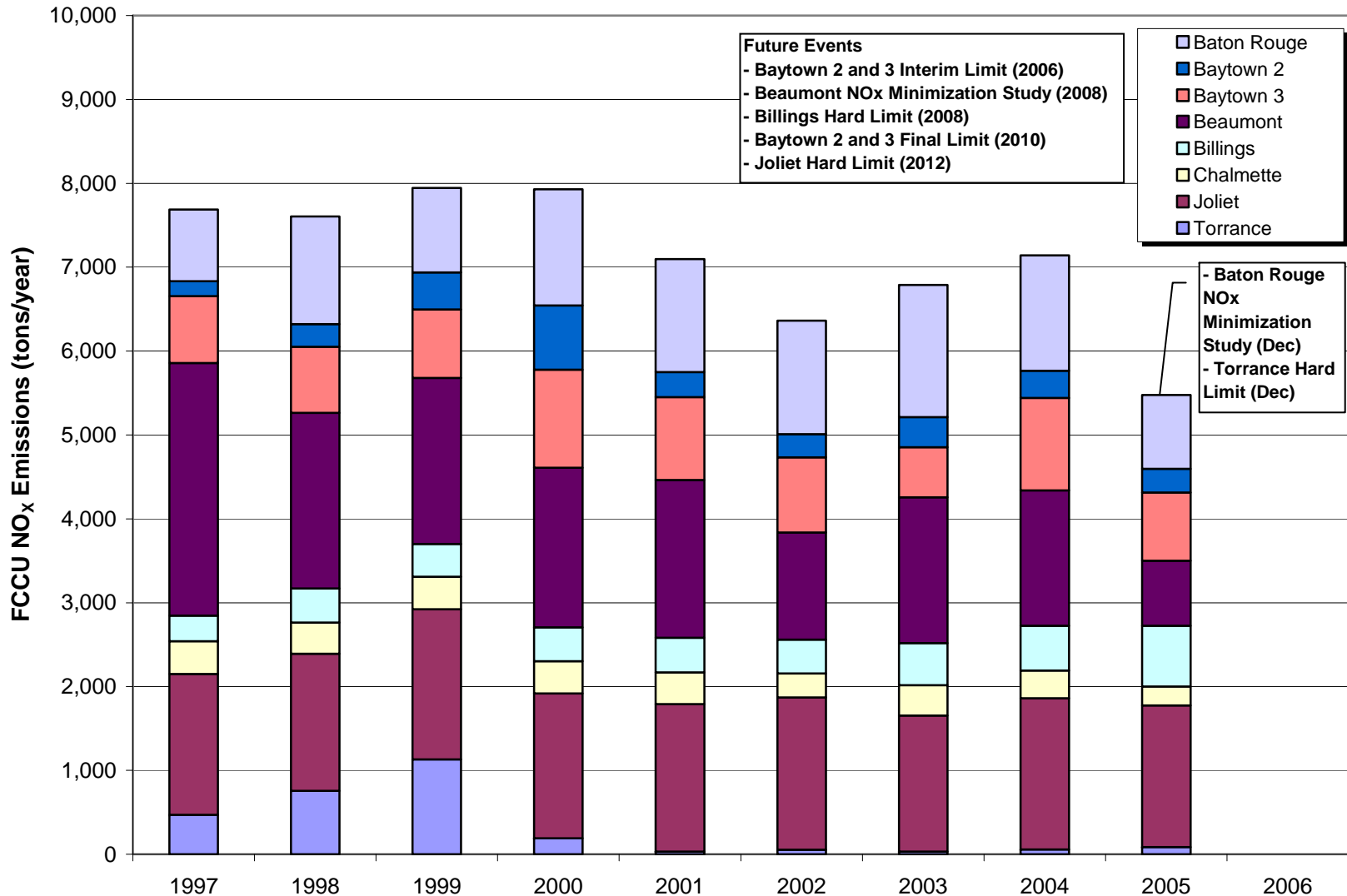
Date of Lodging: 10/11/2005





# ExxonMobil Actual FCCU NO<sub>x</sub> Emissions

Date of Lodging: 10/11/2005



# Total Petrochemicals

May 2007

- 1 refinery in Port Arthur, Texas
- \$37 million in injunctive relief
- Annual Reductions
  - 180 tons of NO<sub>x</sub>
  - 800 tons of SO<sub>2</sub>
- Penalty: \$2.9 million
- SEP: Innovative infrared camera technology to detect leaks of volatile organic emissions from valves, piping and other equipment

# Total Petrochemicals FCCU Emissions Reduction Compliance Dates

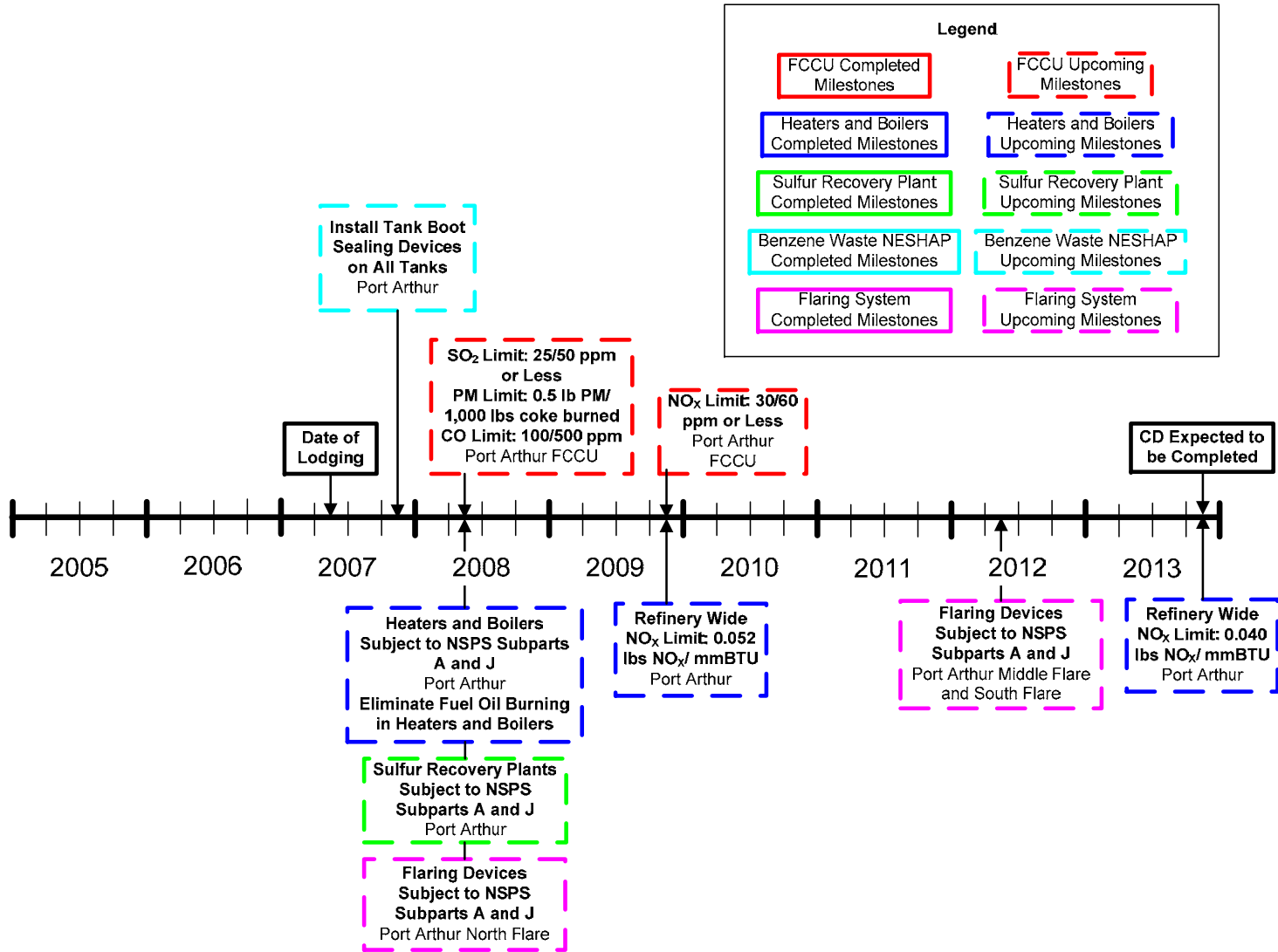
| DOL May 2007         | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Port Arthur          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| FCCU SO <sub>2</sub> |      |      |      |      |      |      | ■    |      |      |      |      |      |      |      |      |
| FCCU NO <sub>x</sub> |      |      |      |      |      |      | ■    |      |      | ▲    |      |      |      |      |      |

Notes:

SO<sub>2</sub>: □ = interim hard limit, ■ = final hard limits, □ = hardware installation, ■ = hardware limits effective, □ = start of additives, ■ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

NO<sub>x</sub>: ▲ = interim hard limit, ▲ = hard limits, ▲ = hardware installation, ▲ = hardware limits effective, ▲ = start of additives and/or low NOx COPs, ▲ = additives demonstration report deadline, Slashes (/) indicate combinations (e.g. either additives or hard limits).

# Total Petrochemicals Emissions Controls Milestones

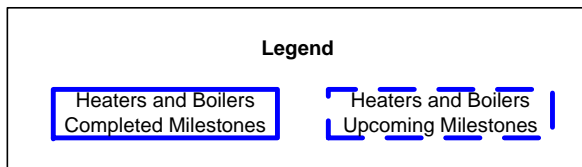
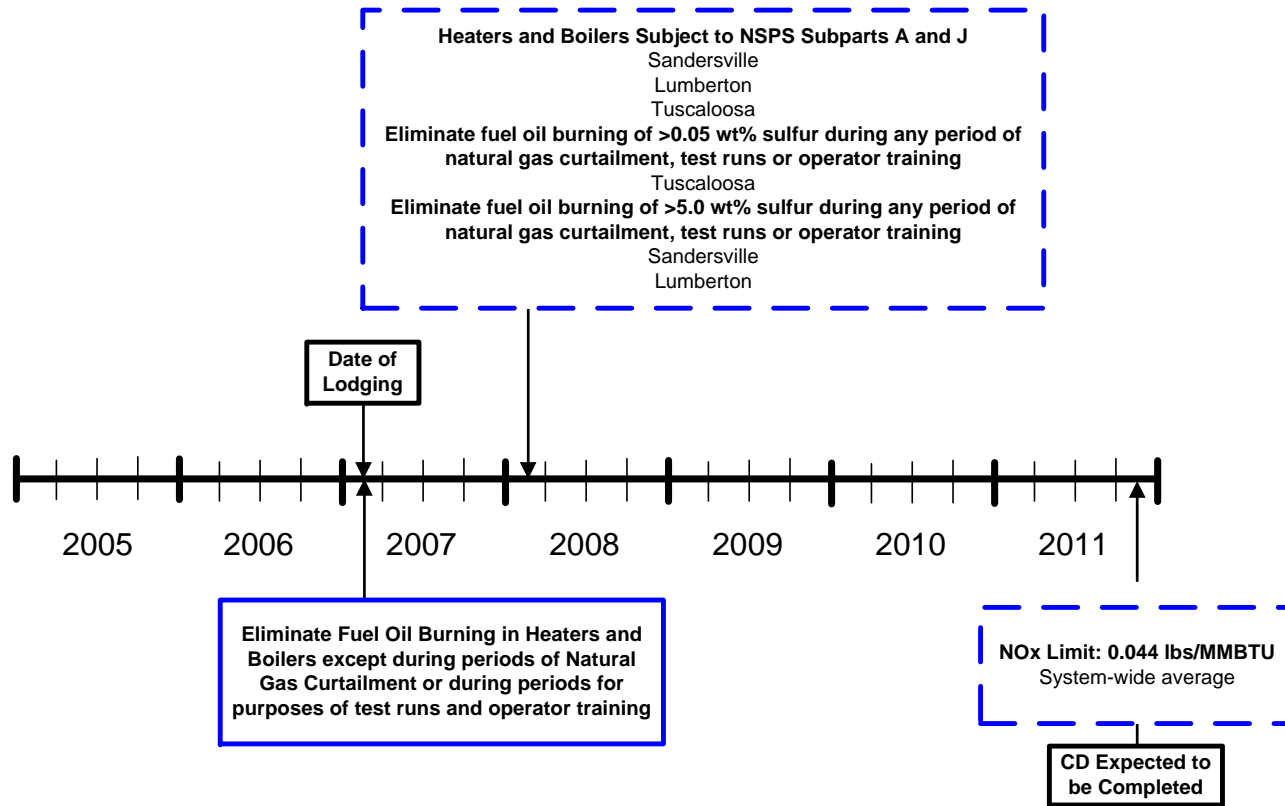


# Hunt Refining

January 2007

- 3 refineries in Alabama and Mississippi
- \$48.5 million in injunctive relief
- Annual Reductions
  - 150 tons of NO<sub>x</sub>
  - 1,100 tons of SO<sub>2</sub>
- Penalty: \$400,000
- SEPs: \$475,000
- Co-Plaintiffs: Alabama and Mississippi

# Hunt Refining Emissions Controls Milestones



# Valero Energy Corp. (formerly Premcor, Inc.)

August 2007

- 3 refineries in Tennessee, Ohio and Texas
- \$232 million in injunctive relief
- Annual Reductions
  - 1,870 tons of NO<sub>x</sub>
  - 1,810 tons of SO<sub>2</sub>
- Penalty: \$4.25 million
- SEPs: \$4.25 million
- Co-Plaintiffs: State of Ohio and Memphis-Shelby County, TN
- Refineries were previously owned by Premcor and purchased by Valero in late 2005

# Valero (Premcor) FCCU Emissions Reduction Compliance Dates

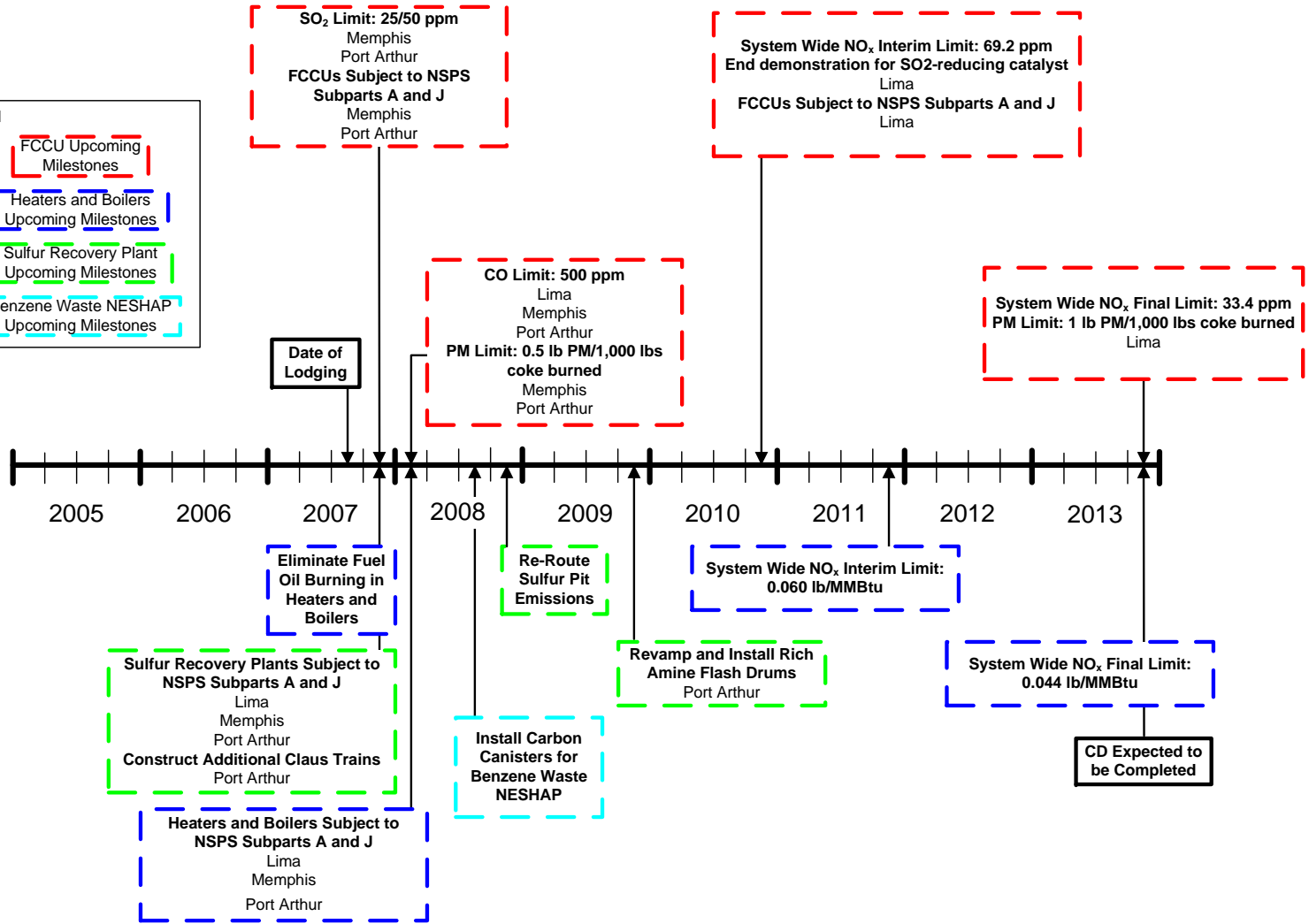
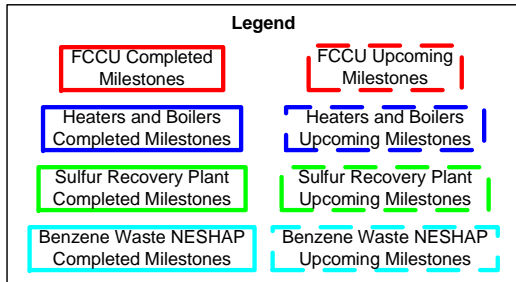
| DOL Aug 2007             |                      | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |  |  |
|--------------------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
| Lima                     | FCCU SO <sub>2</sub> |      |      |      |      |      |      | □    | ■    |      |      |      |      |      |      |      |  |  |
|                          | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      | ■    |      |      |      |      |      |      |      |  |  |
| Memphis                  | FCCU SO <sub>2</sub> |      |      |      |      |      |      | □    |      |      |      |      |      |      |      |      |  |  |
|                          | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      | ■    |      |      |      |      |      |      |      |  |  |
| Port Arthur              | FCCU SO <sub>2</sub> |      |      |      |      |      |      | □    |      |      |      |      |      |      |      |      |  |  |
| System-wide <sup>1</sup> | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
|                          | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      | ■    |      |      |      |      |      |      |      |  |  |

Notes:  
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Footnotes:  
<sup>1</sup>System wide NOx interim limit is effective 12/2010 to include Lima, Memphis, and Port Arthur. The final system wide NOx limit is effective 12/2010.



# Valero (Premcor) Emissions Controls Milestones



# Sinclair Oil Corporation

January 2008

- 3 refineries in Wyoming and Oklahoma
- \$72 million in injunctive relief
- Annual Reductions
  - 1,100 tons of NO<sub>x</sub>
  - 4,600 tons of SO<sub>2</sub>
- Penalty: \$2.45 million
- SEPs: \$150,000
- Co-Plaintiffs: Oklahoma and Wyoming

# Sinclair Oil Corporation FCCU Emissions Reduction Compliance Dates

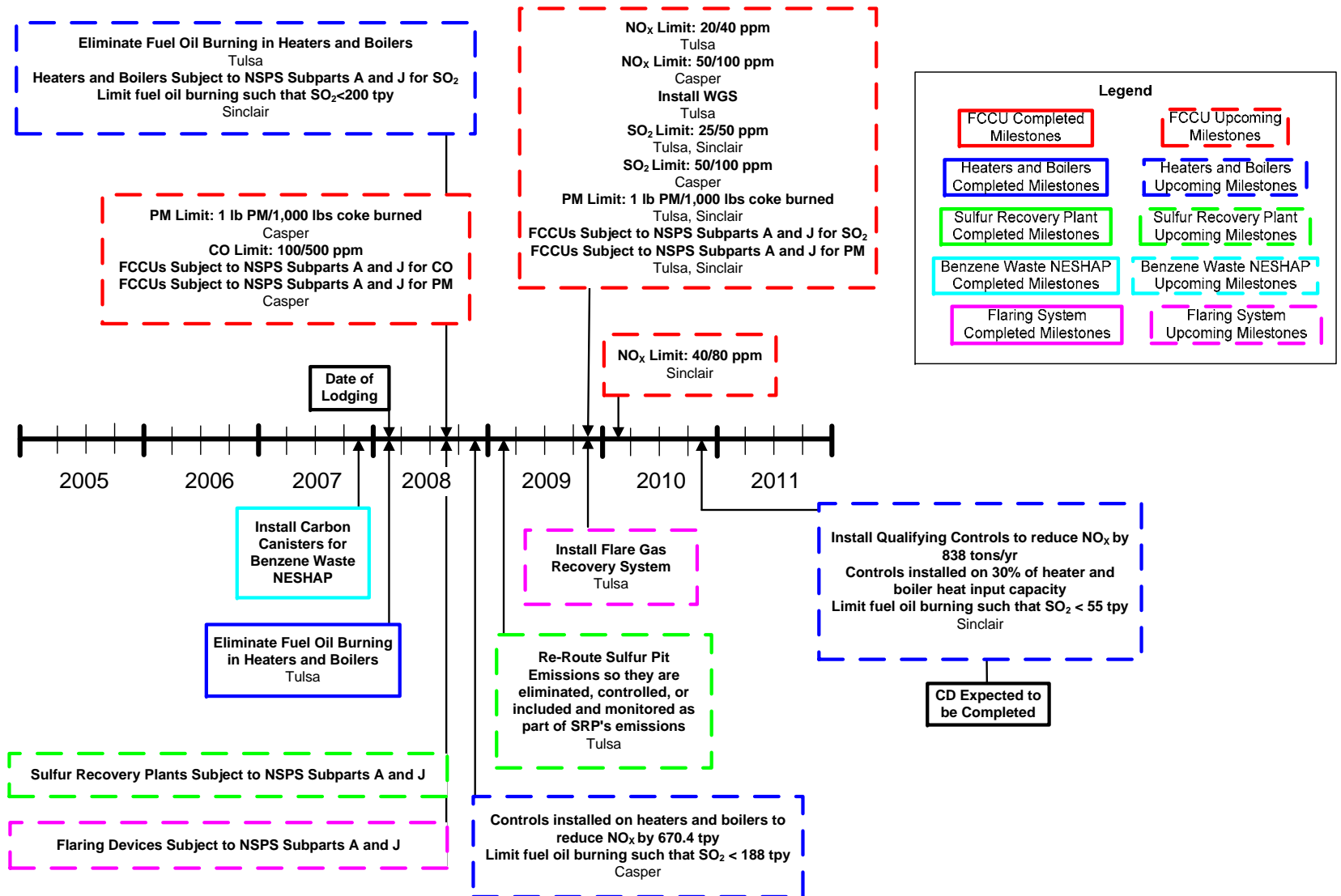
**Sinclair Oil Corporation Consent Decree Emissions Reduction Compliance Dates**

| DOL Jan 2008 | 2001                 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|--------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Casper       | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|              | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Tulsa        | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|              | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Sinclair     | FCCU SO <sub>2</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|              | FCCU NO <sub>x</sub> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

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Footnotes:  
 \*Casper and/or Sinclair: may accept 20/40 ppm to be achieved by 12/31/2012

# Sinclair Oil Corporation Emissions Controls Milestones





# **Petroleum Refinery Initiative**

## **Emissions Monitoring Requirements**

# Types of Emissions Monitoring Methods

- Continuous Emissions Monitoring System (CEMS)
  - Installed, certified, maintained and operated in accordance with 40 CFR §§ 60.11, 60.13, and Part 60 Appendix A
  - Relative Accuracy Audit (RAA) or Relative Accuracy Test Audit (RATA) conducted once every three years
  - Cylinder Gas Audit (CGA) conducted the quarters when RAA or RATA are not
- Continuous Opacity Monitoring System (COMS)
  - Operate continuous opacity monitoring system (COMS) in accordance with 40 CFR §§ 60.11, 60.13, and Part 60 Appendix A
- Parametric or Predictive Emissions Monitoring System (PEMS)
  - Mathematical model calculating pounds pollutant per mmBTU using heater and boiler operating parameters
  - Consistent with CEMS data frequency requirements of 40 CFR Part 60
- Stack Tests
  - Conducted in accordance with 40 CFR Part 60 Appendix A or EPA-approved alternative method

# Fluid Catalytic Cracking Unit (FCCU) Emissions Monitoring

- SO<sub>2</sub>, NO<sub>x</sub>, CO, and O<sub>2</sub>: CEMS
  - CEMS installed prior to conducting performance tests
  - Calibration drifts of CEMS checked daily
  - CEMS sample, analyze, and record data for each successive 15-minute period
  - 1-hour averages computed using the 15-minute CEMS data
- PM: Stack Tests
  - Stack testing according to 40 CFR Part 60 Appendix A Methods 5B or 5F; typically annually, but frequency can vary by consent decree
  - Some consent decrees also require COMS for opacity

# Heater and Boiler Emissions Monitoring

- Capacity greater than 150 mmBTU/hr
  - NO<sub>x</sub>, CO, and O<sub>2</sub>: CEMS
- Capacity between 100 and 150 mmBTU/hr
  - NO<sub>x</sub>, CO, and O<sub>2</sub> : CEMS or PEMS
- Capacity less than 100 mmBTU/hr
  - NO<sub>x</sub>, CO, and O<sub>2</sub>: stack tests or portable continuous analyzer



# Sulfur Recovery Plant (SRP)

## Emissions Monitoring

- SO<sub>2</sub>: CEMS or EPA-approved alternative
  - Monitor and report all excess emissions as required by 40 CFR §§ 60.7(c), 60.13, and 60.105(a)(5), (6), or (7)
  - Develop and implement a Preventative Maintenance and Operation Plan to reduce SO<sub>2</sub> emissions using good air pollution control practices

# Hydrocarbon Flare Emissions Monitoring

- One of the following requirements apply:
  - Install and operate CEMS or PEMS
  - Control flaring by operating flare gas recovery system to control continuous or routine flaring
  - Eliminate the routes of generated fuel gases and only flare:
    - Process upset gases;
    - Fuel gas released as a result of relief valve leakage; or
    - Gas released due to a malfunction
  - Eliminate the routes of generated fuel gases and monitor the flare with CEMS or a flow meter

# Benzene Emissions Monitoring

- 40 CFR Part 61 Subpart FF Benzene Waste NESHAP (BWON)
  - Sampling for benzene concentration according to 40 CFR §61.355(c)(3)
  - If Total Annual Benzene (TAB) emissions less than 10 Mg/yr, then exempt from BWON
  - If TAB emissions greater than 10 Mg/yr, then develop and implement a plan identifying a strategy to ensure compliance with BWON

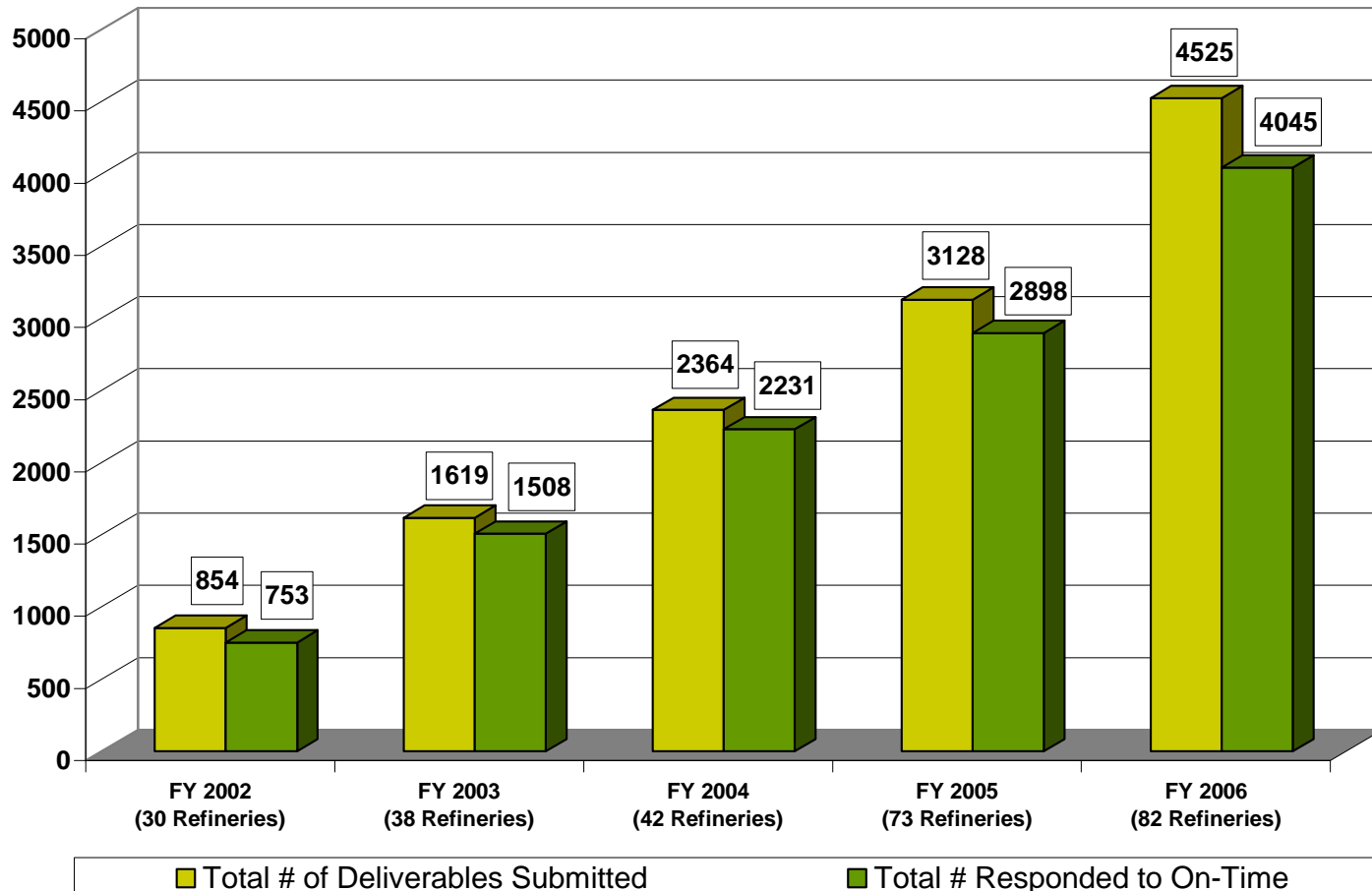
# Leak Detection and Repair (LDAR) Emissions Monitoring

- Develop and implement a program to achieve and maintain compliance with state and federal LDAR regulations (e.g., 40 CFR Part 60 Subparts VV and GGG)
- Program must include:
  - Refinery wide leak rate goal
  - Identification of all equipment with the potential to leak
  - Procedures to identify, repair, and track leaky equipment
  - LDAR audits

# Implementation of Decrees

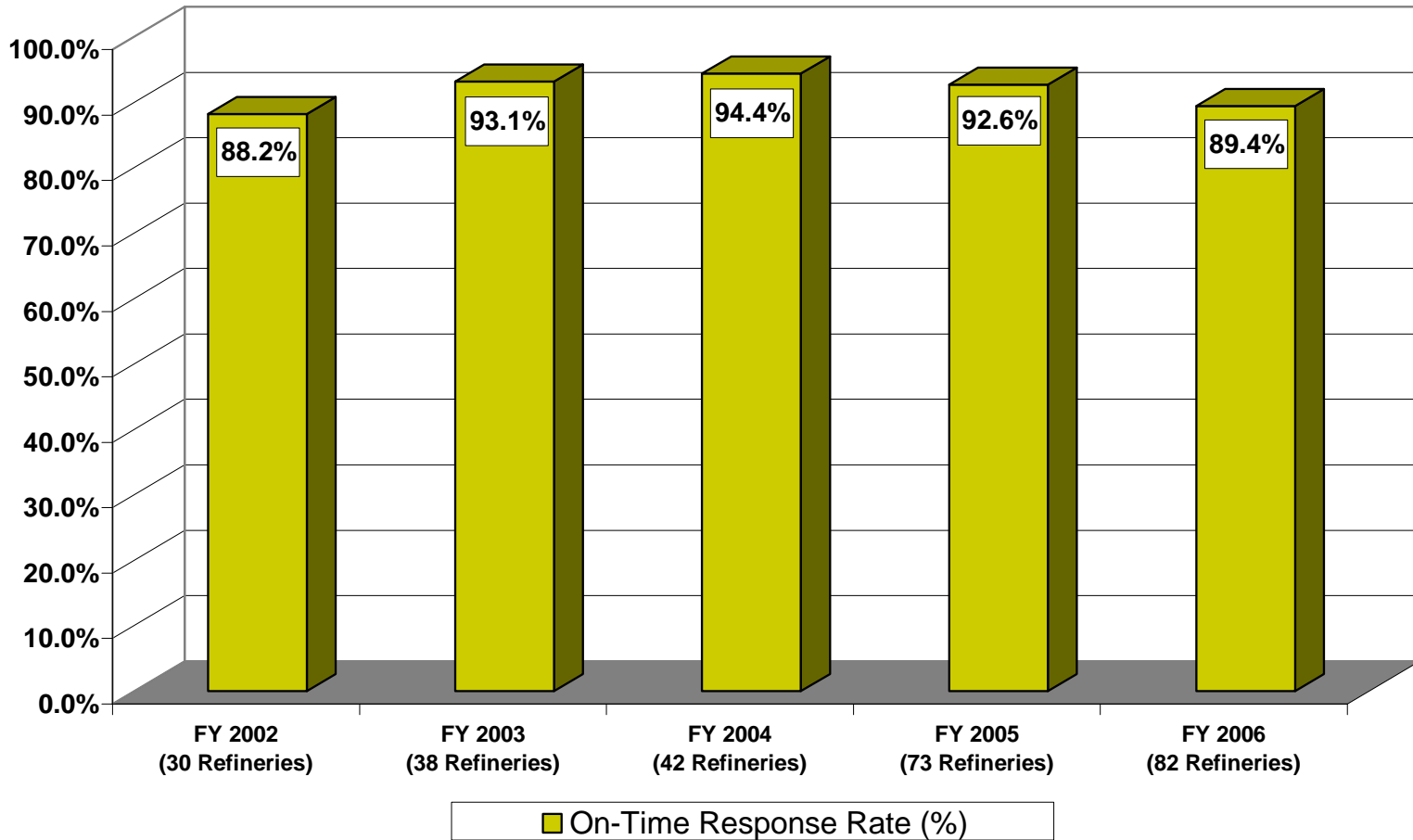
## Volume of “Deliverables” Submitted under Decrees

“Deliverables” Include Reports of Flaring Incidents and Corrective Action, Biennial Reporting, etc.



# Implementation of Decrees

## Improvements in EPA Responsiveness



# Next Steps

- **Continue work toward bringing the remainder of the refining industry under settlements for all “marquee” Clean Air Act issues, or by referral to DOJ or filed enforcement action.**
- **Negotiations currently ongoing with refiners representing a sizable percentage of the remaining 20% of industry**
- **Maintain focus on implementation of Consent Decrees to achieve expected emissions reductions.**

# Link and Contact Information

- **EPA National Petroleum Refinery Initiative (NPRI) Website:**  
[www.epa.gov/compliance/resources/npriresources](http://www.epa.gov/compliance/resources/npriresources)
- **EPA Headquarters Contact: Patrick Foley, Senior Environmental Engineer, (202) 564-7978**